MAY 23, 1955

STEEL
The Metalworking Weekly

NEW BULK HANDLING
On Ol' Man River

More metalworking products move on inland waterways and more go into facilities to handle traffic that's nearly tripled in a decade, page 68

✔ Shot Peening for Safety
page 102

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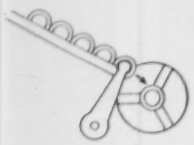
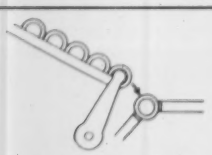
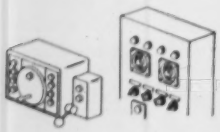


AUTOMATIC CHUCKING



AUTOMATIC LOADING AND LOCATING, CENTRI-MATIC



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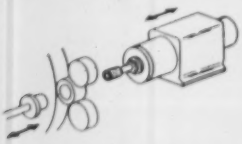

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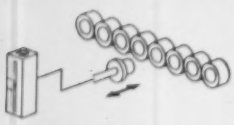

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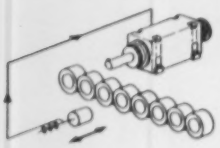

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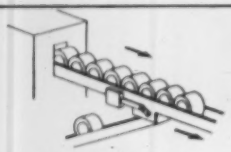

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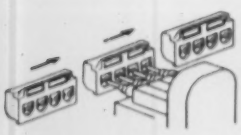


AUTOMATIC TRANSFER

Heald transfer-type Bore-Matic arranged for fully automatic drilling, reaming, boring and facing of valve seats and stem holes in automotive cylinder heads. Machine consists of a series of basically standard Heald way-leg units, sequentially machining the work through the various stations to the far end fully automatically.

Heald battery-type Internals permit fully automatic operation of a bank of machines from a single hydraulic power unit. One operator can easily tend several machines.

How Heald AUTOMATION fits into your production plans

AUTOMATION is the newest trend in modern production efficiency. Yet it has occupied the attention of Heald engineers for many years. In fact a number of important developments contributing to fully automatic operation were developed here at the Heald plant more than a decade ago. And research on automation has progressed unceasingly, as witnessed by scores of fully automated transfer machines, way-type Bore-Matics and battery type Internals now operating successfully in the field.

This background of experience is at your disposal—ready to solve virtually any precision finishing problem, carrying it through in many cases from rough casting to finished part. Your nearest Heald representative will welcome an opportunity to show you how Heald AUTOMATION can step up precision and production, with important savings in time and cost factors.

You'll find that IT PAYS TO COME TO HEALD!

THE HEALD MACHINE COMPANY ®

HEALD

WORCESTER 6, MASSACHUSETTS

Offices in Chicago • Cleveland • Dayton • Detroit • Indianapolis • New York

THEY'RE EASY TO WELD Bethlehem Flanged-and-Dished Heads are easy to weld because they are made from grades of steel of uniformly high quality. What's more, they come in a range so wide as to meet virtually every requirement. Styles: ASME Code flanged-and-dished, standard, elliptical, flanged-only, dished-only, shallow-dished, tank car, obround and double-dished. Diameters: up to 144 in.; Thicknesses: 14 gage to 3½ in. Bethlehem also produces standard manhole and handhole saddles, covers and fittings, and collar and pipe flanges. We also furnish heads having flued openings and machined edges. The nearest Bethlehem Sales office will be pleased to furnish full details.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

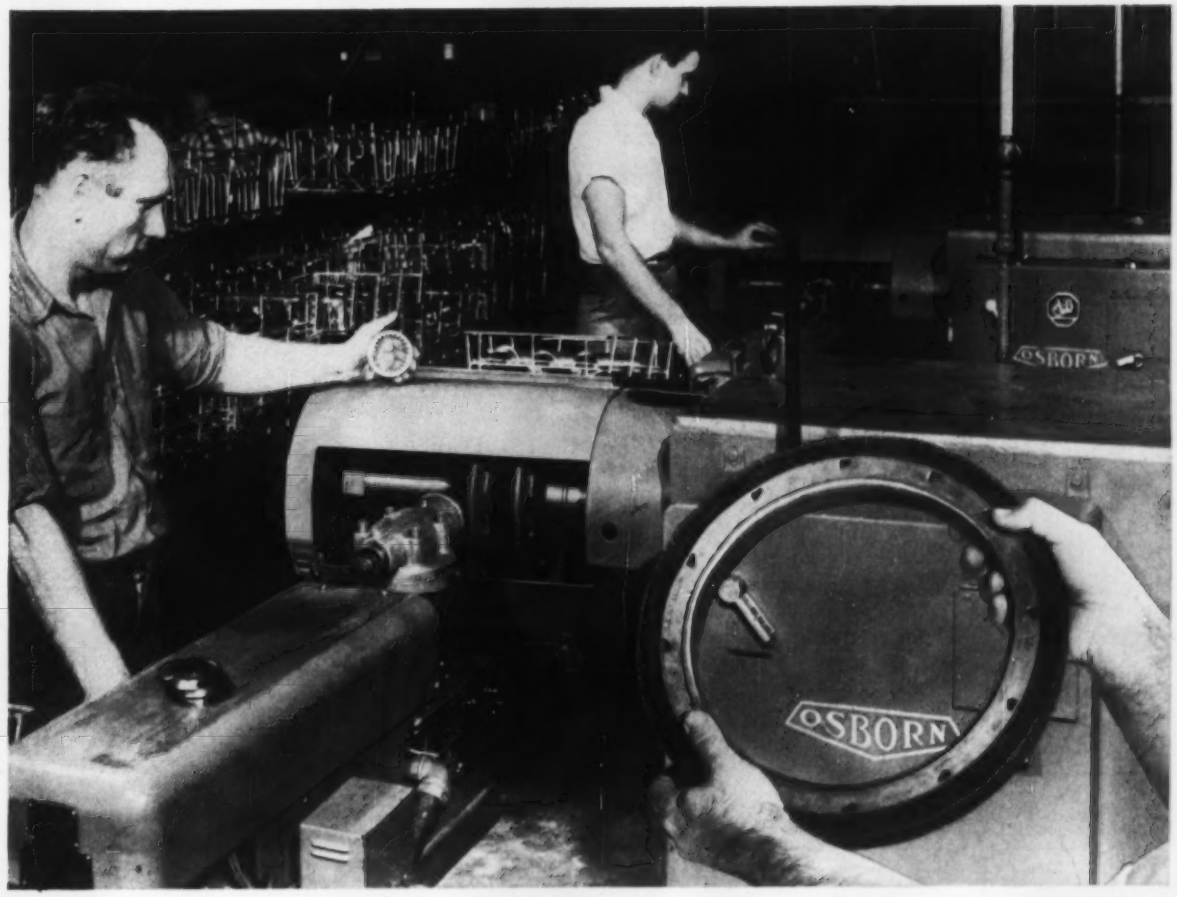
REPORT FROM DANLY

15 years heavy handling "AROUND THE CLOCK" from 9 Whiting Cranes!

In 1940, Danly Machine Specialties, Inc., a leading manufacturer of mechanical presses, installed nine Whiting Overhead Electric Traveling Cranes in their Chicago plant. These cranes have been in operation practically 24 hours a day, six days a week, for fifteen years. All production moves via these cranes, and Danly depends on them to meet schedules without fail. This phenomenal record is the result of (1) Danly's program of specialized crane maintenance, (2) the foresight of Danly executives and Whiting engineers — working together and planning the installations to meet *future* as well as present needs, (3) the outstanding features built into Whiting Cranes that assure peak performance at low cost. These features, to mention a few, include anti-friction bearings, precision-made gears, securely-fitted shafts and flanged couplings. Send for our new booklets — Unit 79 "How to Select A Crane" and Unit 80 "Presenting Whiting Cranes."

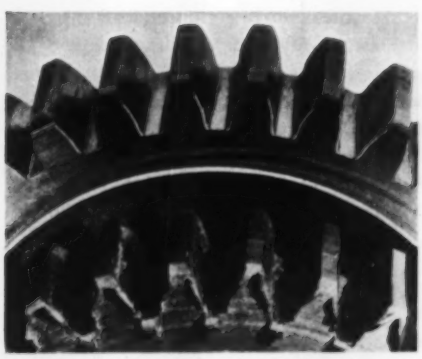
WHITING CORPORATION
15643 Lathrop Avenue, Harvey, Illinois

Cranes • Trambeam • Trackmobile • Chemical Processing, Foundry and Railroad Equipment



Remove burrs faster with this push-button method

An OBA will show you how



IMPROVED GEAR QUALITY. *This before-after view of gears shows how Brushamatics remove burrs and blend surface junctures. Result is fewer stress concentrations, longer gear life.*

HERE, you see push-button power brushing removing burrs *and* blending surface junctures on automotive gears faster than any other method.

Operating automatically on preset time cycles, two Osborn Brushamatic* machines maintain strict uniformity of quality at a rate of more than 2000 gears a day.

And, in another plant, a manufacturer reports one Brushamatic saves more than 1000 manhours every year in finishing 17 different types of gears.

Why not have an **O**sborn **B**rushing **A**nalysis discover cost-cutting ways to solve your burr removal problems . . . and cleaning and finishing problems, too? Write for your copy of BRUSHAMATIC IDEAS. *The Osborn Manufacturing Co., Dept. G-32, 5401 Hamilton Ave., Cleveland 14, Ohio.*

*Trade-Mark

Osborn Brushes

OSBORN

BRUSHING METHODS • POWER, PAINT AND MAINTENANCE BRUSHES
BRUSHING MACHINES • FOUNDRY MOLDING MACHINES

MIDVALE *DRUM* SHAFT FORGED TO *BEAT* FATIGUE

Forge it uniformly . . . finish it to extremely close tolerances . . . and deliver it fast—they were the requirements on this large alloy steel drum shaft for a mine overseas. In record time Midvale poured the ingot, shaped the shaft in its huge presses and had it finished to an overall length of 40 feet 6 inches, diameter of 38 inches with a bore of 7 inches.

This type of service has been routine to the men of Midvale for more than a half a century. They have made a specialty of supplying the mining industry with large forgings and castings of all types. Midvale quality is carefully guarded from the time the ingot is poured until the finished piece is loaded for shipment. Tests and supervised inspections are made in every step of production. Final tests—X-ray, sonic and others as specified—assure sound forgings and stainless steel castings for outstanding performance in the most severe service.

Next time you need shafts, rolls, roll shells, gear rings or high alloy castings get in touch with Midvale. You can be certain of satisfactory service and products.

THE MIDVALE COMPANY- Nicetown, Philadelphia 40, Pa.

Offices: New York, Chicago, Pittsburgh, Washington, Cleveland, San Francisco

MIDVALE

FORGINGS, ROLLS, RINGS, CORROSION AND HEAT RESISTING CASTINGS

STEEL
The Metalworking Weekly

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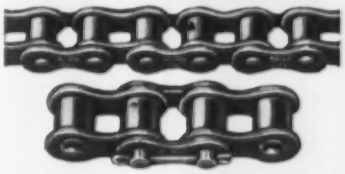
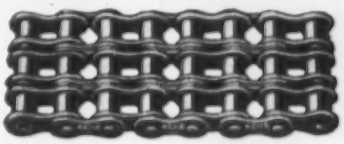
WRITE FOR THIS
FREE
TEXT

An accurate and useful 76 page compilation of chain data. A valuable textbook for engineers . . . grows to be indispensable. Free upon request to Dept. 10-U, ACME CHAIN CORP., Holyoke, Mass.

COMPLETE PRODUCTION FACILITIES AND PROMPT DELIVERY ON ALL THESE CHAINS

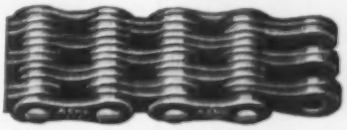


STANDARD ROLLER CHAINS
Available in pitches from ⅜" to 2½" riveted and detachable type.



STANDARD MULTIPLE WIDTH
Multiple widths of six strand or wider available for special application.

DOUBLE PITCH CHAIN
For use in slower speed power transmission and material handling conveyors.



CABLE CHAINS
Acme Cable Chains are furnished in a variety of pitches, widths and strength.

SPROCKETS
Acme Sprockets are available in a wide range of sizes, in all types.

PHONE JEfferson 2-9458.

Acme Chain Corporation
HOLYOKE MASSACHUSETTS

That 5 minute talk

SAVED $6,532 on fuel

It's tough on the BTU Burglar, but the word is getting around just the same . . . that industrial furnaces *don't* have to be burgled for billions of BTU's—worth thousands of dollars—per year.

Typical example: A bolt manufacturer relined three furnaces with *lightweight* B&W Insulating Firebrick. Analysis of fuel cost per ton of steel reveals that the B&W linings save $6,532 per year, compared with the ordinary heavy firebrick linings in the plant's other furnaces.

Heavy furnace linings waste your fuel dollars two ways: They soak up and hold large quantities of heat which are lost when the furnace is cooled; and they conduct and lose too much heat through the walls. Lightweight insulating firebrick, containing millions of tiny air cells, heat up and cool quickly, absorbing and storing very little heat. Also, they resist heat flow, keeping it inside the furnace to do productive work.

If you want to save on fuel, your logical choice is the lightest weight refractory you can buy—*lightweight* B&W Insulating Firebrick.

Investigate now so that you can try B&W Insulating Firebrick next time you reline your furnace or kiln. Write today for complete facts or contact the B&W Refractories Engineer in your locality.

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REFRACTORIES DIVISION
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WORKS: AUGUSTA, GA.

R-506

behind the scenes

Brant Eats Record

STEEL artists and editors teamed up last week to mount an assault on some innocent fish that were living peaceably in a nearby river. Assistant Editor Austin Brant and Artist Tom Welsh found the fishing hole, and quickly extracted 11 prime rock bass. On the following night, Editors Tom Hruby and Jim Morrissey and Artist Ace Bouhall joined the safari, and five more fish were caught. By that time the law of supply and demand caught up with them, and even Bouhall, the acknowledged master fisherman of the lot, added nothing more to the catch, unless it was a cold. He stepped on a stone that offered no traction, and ended up (or up ended) in two feet of very cold water. Brant was the unhappiest sportsman of the lot: The rock bass he had captured the first night proved to be a record specimen, but when contest officials asked him about it, Austin gulped, and said: "I et it!" His fish was a 2 pounder. The previous record was 1 lb 2 oz.

Bard Beats "8" To The Sand Bar

Once upon a time, while sipping stale cocktails at a stale party, we made the mistake of asking a perfect stranger if he entertained any theory that might explain the phenomenon of chlorophyll. The stock answer to such a silly question was supposed to be: "Beats me Mac; how about freshening up our drinks?"

Unfortunately, the stranger turned out to be a cross between Einstein and John Burroughs. Twenty minutes and five thousand multisyllabic (ain't that a pip?) words later we became so tangled in actinic rays, angles of the sun and something called photosynthesis we began slipping cogs. Even to this day, when spring comes surging north on her tide of (we're sorry we ever mentioned it) chlorophyll, we get panicky, and try to escape by reaching for the rhyming dictionary.

This week, as you've noted by the cover, STEEL features a spread concerning river transportation (page 68). There are thousands and thousands of miles of navigable inland waterways in this country, and if you haven't been particularly interested in this type transportation, you are going to be astounded when you learn how much tonnage is being hauled up and down our rivers and canals every day. True, the sidewheelers are gone; and rivers are bridged and dammed; and water pollution is a scandal, as well as a sin; and romance has fled from the waterways in a cloud of diesel fumes—but it's still easy to close your eyes, and let your imagination go, go, go!

Let us wander on the river, where
the placid waters flow;
Let the whistle wake the echoes,
as it used to long ago.
Bring us back the golden era when
the steamboats plied the streams;
Ah, the phantom bells are pealing
and the shores are locked in dreams.
They are running down the channel
and their pilots let them roll,
As the leadsmen chant the soundings
where the ripples mark the shoals.
Now they've dropped beyond the valleys where the ghostly river wends;
They have vanished where the willows
weep beside the distant bends.
But their whistles wake the echoes
as they roll in memory.
Through the forest and the prairie,
From the mountains to the sea.

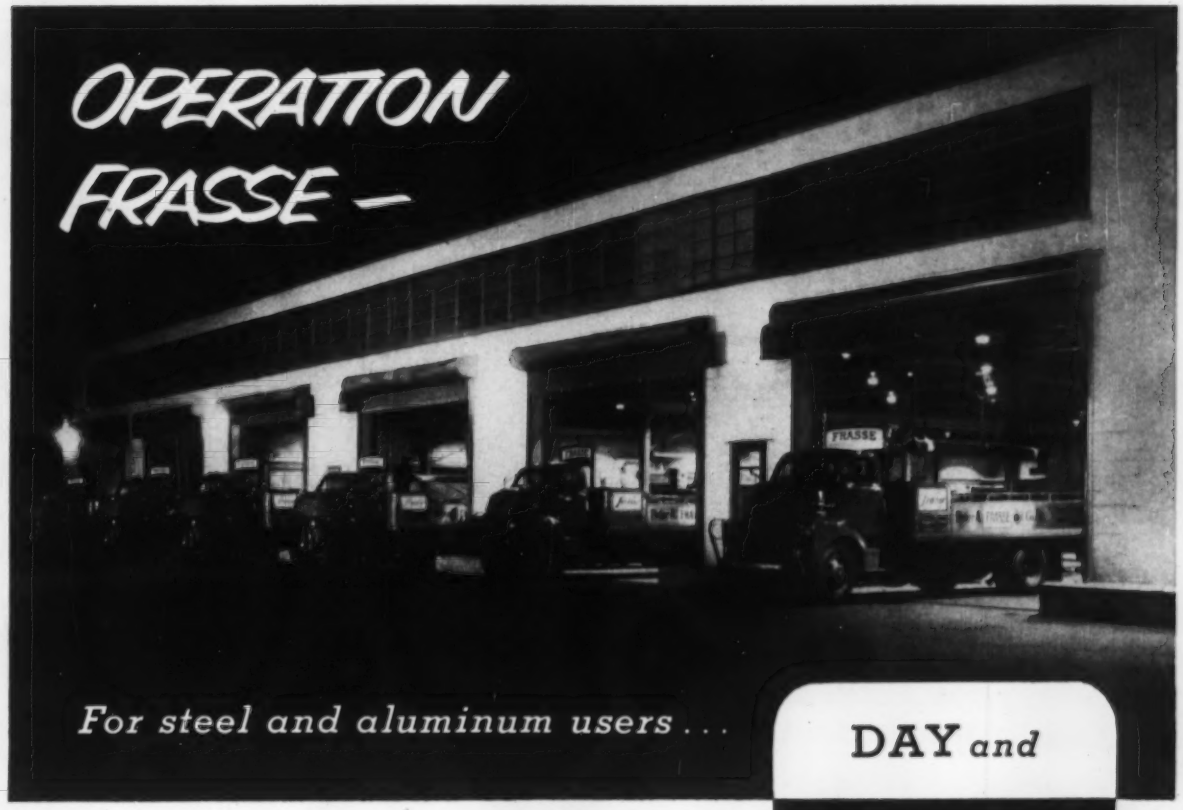
Dig These Digits

Raymond was 189, and all our regulars came through with flying colors. Oddly enough, we received more wrong answers than right ones. Maybe that Jean-Baptiste-Achille business was too confusing, but if you think that one was sneaky, get a load of *this* one:

We're playing with digits again. Just to get you in the mood, what number is 11 times the sum of its three digits? Now that you know how it's done, and still using three digits, how many numbers are twice the numbers formed by reversing the order of their digits?

Shrdlu

(Metalworking Outlook—Page 51)



DAY *and*

NIGHT

While you sleep, loading operations are underway . . . before you awaken modern Frasse trucks are rolling with material you ordered hours ago.

This fast, on-the-ball delivery is typical of the handling your orders receive when you do business with Frasse. Thousands of firms know this service is *routine* . . . and depend on quick, sure delivery from Frasse to keep production lines producing.

Frasse stocks *all* of the popular grades, shapes and sizes of stainless, alloy and carbon steels, tubing and aluminum . . . plus many specials, too. When you work from complete Frasse warehouse stocks you eliminate needless "shopping".

And, remember — Frasse engineers are always available to consult with you on problems involving steels, tubing and aluminum. Their services are free, and they can be consulted anytime — by mail, phone . . . or on the spot in your plant.

It's

FRASSE

for complete warehouse service

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SEAMLESS TUBING

•

STAINLESS, ALLOY
& CARBON STEELS

•

ALUMINUM

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LYNDHURST ROCHESTER BALTIMORE

IT'S THE NEW, "YEARS-AHEAD" LINE...

Far out front on every point of comparison

COMPLETE LINE FROM 50 TO 775 TONS

NIAGARA MACHINE & TOOL WORKS
75
1879 1954

America's Most Complete Line of Presses, Shears, Machines and Tools for Plate and Sheet Metal Work

...NIAGARA

ALL STEEL PRESS BRAKES

"MULTI-MACHINE" VERSATILITY TO BOOST PRODUCTION

Practically limitless in their scope of forming, bending, punching, blanking and related operations, Niagara Press Brakes get more done for you because they do more jobs. One reason: Advanced design. Another: The extensive line of Niagara Press Brake Dies available.

UNIFORM BENDS WITH STRAIGHT-EDGE ACCURACY

Double end twin drives with double reduction gearing, *on all models*, provide uniform, constant application of power at both ends of the ram. Off-center loading presents no problem.

Rugged, streamlined frames feature box type crowns of unequaled strength and rigidity, assuring maximum resistance to deflection and permanent alignment of bearings and ram.

3-SHIFT STAMINA TO HANDLE WORK-HEAVY SCHEDULES

Close attention has been given to every design detail. Nothing has been overlooked. Each frame size has been scientifically tested to detect and eliminate harmful stresses at all critical points.

Laminated non-metallic ways, an exclusive Niagara feature, reduce wear to an absolute minimum, providing accurate alignment and longest possible service life. All gearing is totally enclosed in sealed oil baths for thorough, clean lubrication.

Once again, Niagara's forward-thinking engineering has produced a metal working machine years ahead of its time. As you become familiar with the significant developments embodied in this revolutionary new line of all steel press brakes, you will realize why it carries the Niagara nameplate. After all, who is more uniquely qualified to be its builder than the builder of America's most famed and most complete line of presses, shears, other machines and tools for plate and sheet metal work?

Call in your nearest Niagara representative at once. Let him tell you, *in detail*, what these great, new press brakes can do for you.

CHECK ALL THE FACTS, YOURSELF!

Compare. Make a careful, feature-by-feature appraisal of Niagara's years-ahead press brake design. Write for new Bulletin 89C . . . the most comprehensive press brake literature ever published.

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BUFFALO 11, N. Y.
DISTRICT OFFICES:
Detroit • Cleveland • New York • Philadelphia
Dealers in principal U. S. cities and major foreign countries

engineered to expand your output ...AT SAVINGS!

The above Knurled Head Machine Screw represents another difficult cold heading job successfully accomplished at lower cost per unit by Keystone "Special Processed" Cold Heading Wire.

The superior grain flow characteristics of "Special Processed" Wire provide the desired upsetting and die forming qualities necessary to form the thin head section without cracking. The structural soundness and uniformity of "Special Processed" Wire further proved itself by trouble-free machine operation, longer die life and a finished product of the highest quality.

On your next recessed head or other difficult cold heading job, try "Special Processed" Wire. See your Keystone representative or write for more information.

LETTERS
TO THE EDITORS

Magnesium Smelting

Can you tell us where to get a complete list of the magnesium smelting companies in the United States?

Otto K. Namtvedt
vice president
Midwest-Overseas Trading Corp.
Milwaukee

• *The only primary smelter of magnesium is Dow Chemical Co., Midland, Mich., but there are several secondary ones. We suggest you write Jerry Singleton, executive secretary, Magnesium Association, 122 E. 42nd St., New York, N. Y.—ED.*

Excellent Present

In my travels about the Hartford, Conn., area, I see your publication in many reception rooms of industrial concerns.

I have a younger brother, greatly interested in engineering, who is entering R.P.I. this year. He has never seen your magazine, and I would like to have him exposed to a sample of the fine ideas and articles it presents. It should be a thrilling eye opener to him and, incidentally, a perfect birthday present if received this month.

Would you send him a copy of a recent issue?

Burton H. Knust
Hartford, Conn.

Dawn of New Day

I have been following with interest . . . the use of oxygen in the blowing of basic bessemer steel.

The summation of the process in the U. S. and Canada in your article, "Oxygen Steelmaking Arrives" (Apr. 4, page 80), states that results show a method . . . which, with a relatively low capital investment, can produce steel several times faster than the best open hearth practice (with, if anything, a better quality at lower cost).

As the picture appears, it will be difficult to justify replacement of open hearth plants or their installation in the future.

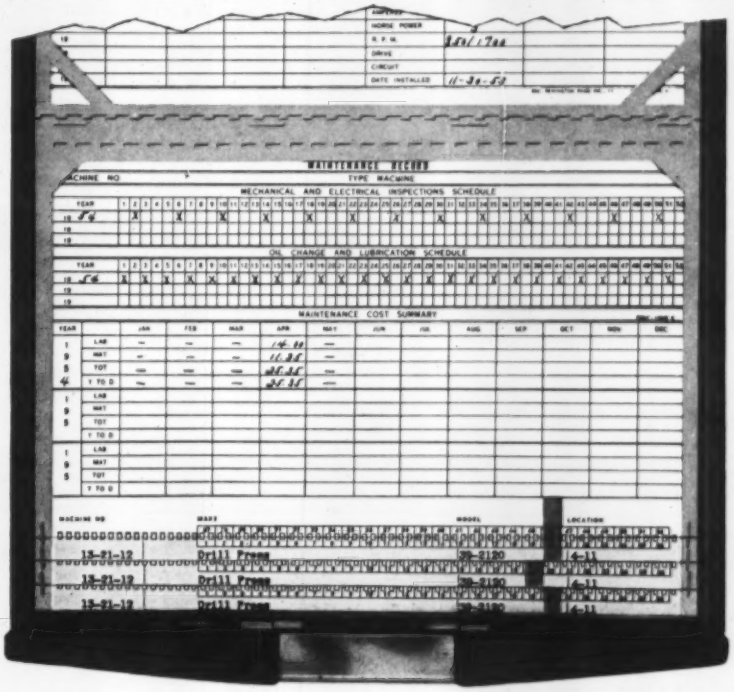
The trend will be toward the oxygen blown bessemer to the limit of the hot metal available. With the pressure for hot metal and little, if any, purchased scrap in the charge, the demand for scrap will be greatly reduced. This accumulation of scrap and accompanying drop in price normally would result in a marked advantage to the economic position of the electric arc furnace as a steel producer . . . were it not for the uncertainty of the market and the conviction that increased demand for scrap would soon raise its price to where the electric furnace would again

(Please turn to page 12)

Remington Rand

BETTER BUSINESS METHODS

For Greater Profits Through Lower Costs



Integrated Preventive Maintenance Program Protects Capital Investment, Cuts Down-time and Product Costs

A well-integrated Preventive Maintenance Program will include: Equipment Records, Maintenance Parts Control, Written Work Orders, Work Scheduling and Executive Reports.

A Kardex Equipment Record (partially illustrated above) gives a complete machine history, at a glance. This record includes a history of depreciation, mechanical and electrical inspections, oil change and lubrication, plus a *maintenance cost summary*, to aid management decisions on machine replacement or retirement.

Written Work Orders are essential for planning job assignments and for correct cost accounting. They alert maintenance executives to all conditions affecting work to be performed, put an end to the errors and misunderstandings that result from verbal orders.

Your *integrated* system will aid in the preparation of Executive Reports. Here, visibly-signalled Kardex records have proved to be most efficient. More details on this phase, and on the entire Maintenance Control System, are yours in booklet X1383, offered in the coupon.

Tight Maintenance Parts Control Helps Reduce Inventory Investment, Production Stoppage, Overtime

With tight control over parts and supplies, scheduled maintenance and necessary repairs are expedited; production stoppage and overtime are held to a minimum. Maintenance parts records should list available balances on hand, usage and trend of usage, vendors, date and quantity of last order. Effective control includes a numbering system to eliminate duplicate items, cut inventory investment. Kardex Visible records, with movable Graph-A-Matic signals, save time by focusing attention on items nearing reorder point. See booklet X1383.

Sched-U-Graph Controls Maintenance Force Workload for Proper Job Sequence; Minimizes Lost Man-hours

To be effective, any preventive maintenance system will *plan* the workload for each member of the maintenance crew. The ideal method of workload scheduling is the *visible* method; the ideal visible tool for the job is the Remington Rand Sched-U-Graph.

Sched-U-Graph assures handling of maintenance jobs in proper sequence, for minimum interference with production. Sched-U-Graph tells the foreman, at a glance, what job each worker is on and how long

it should take, or, if he is free for immediate assignment. Result: Increased efficiency on the part of each worker, higher output, less waste. Further details on visible scheduling with Sched-U-Graph are contained in booklet X1383. Send for your free copy today.

Remington Rand

Room 1573, 315 Fourth Ave., New York 10

Yes, I'd like to have Booklet X1383.

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1-33

Profit-Building **IDEAS** For Business

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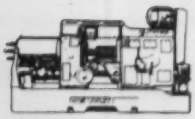
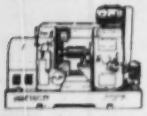
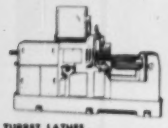


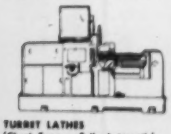
BAR AUTOMATICS
4 Spindle — 7 sizes; 1 to 7⅝"
6 Spindle — 9 sizes; ⅝ to 6"
8 Spindle — 6 sizes; ⅛ to 4"



CHUCKING AUTOMATICS
4 Spindle — 2 sizes; 10 and 12"
6 Spindle — 4 sizes; 3¼ to 12"
6 Spindle — 2 sizes; 6 and 8"



TURRET LATHES
(Bar-Type — Fully Automatic)
Single Spindle — 3 sizes, 3½ to 5½



TURRET LATHES
(Chuck-Type — Fully Automatic)
Single Spindle — to 12" cap.

CHUCKING AUTOMATIC
Single Spindle ("Chuckmatic")
To 12" capacity

Performing intricate and complex machining operations in seconds where, only a few years ago, minutes—even hours—were required, today's automatic screw machines are marvels of production.

In the final analysis, however, the ability to get *all* the production these machines are designed to deliver depends upon operator experience.

And of equal if not greater importance is the background of tooling experience the machine builder can deliver.

With more Acme-Gridleys in use over the years than any competitive machine, it's a safe bet you'll also find more men trained in the operation of Acme-Gridleys than in any other "automatic."

There is safety (for you) in numbers. All this operator experience, plus the tooling experience gained in more than sixty years by National Acme (more than 300,000 tooling case histories) is available to strengthen your competitive position.

Why not put this experience to work in your shop?

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OUR JOB: TO PROVIDE THE RIGHT MACHINE FOR YOUR JOB!

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LETTERS

(Concluded from page 10)

be at a disadvantage.

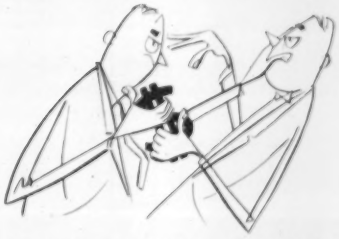
What is needed is assurance that the charge of an electric arc furnace will compare favorably in cost in the future with that of the oxygen blown bessemer or the open hearth. One simple method of producing such a charge involves the use of a highly concentrated iron ore (such as taconite) in the form of pellets for reduction by hydrogen at a temperature range between 1050°F and 1100°F.

Just how much a part the oxygen blowing of hot metal, the hydrogen reduction of iron ore and the production of scrap will have in determining the future of the open hearth only time will tell. But the dawn of a new day in steel mill economics is apparently with us.

Harry W. McQuaid, consultant
Union Commerce Bldg.
Cleveland

• *Mr. McQuaid elaborated more on these points, but we do not have space for the complete letter. We will be glad to supply readers with a copy of it.—ED.*

Splitting the Sales Dollar



Your editorial, "What Price Marketing?" (Apr. 25, page 51), was of interest because of the difference of opinion among our group as to the portion of the sales dollar to be used for promotion.

Can you tell us where to obtain reliable information as to average sales costs and the items of expense which are included in the average?

Most textbooks include inside salesmen, the phones they use and many other items in addition to outside salesmen and direct promotional material.

John G. Kinsey
general manager
Mills Iron Works Inc.
Los Angeles

• *We suggest you consult the survey on cost of sales quoted in our editorial. It was made by the National Industrial Conference Board Inc., 247 Park Ave., New York, N. Y., and was published in the Conference Board's* Business Record *for April, 1955.—ED.*

Thought Provoking

Your discussion on the implications of Mr. Reuther's demands for a guaranteed annual wage provoked considerable thought around here. We hope we are not too late in asking for several copies of "What Price Annual Wage?" (Mar. 7, page 59).

The service your publication renders in educating industry on the pitfalls of this monster child of the "something for nothing" school is invaluable. We hope for more on this subject.

Bruce R. Hunt
Commercial Filters Corp.
Melrose, Mass.

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HAMILTON CANADA

Design—Johnson music wire, to be used in a volume control spring for your television set, is looped through a 180-degree arc and rotated through millions of cycles on this rotating beam fatigue tester (left). The spring designed from this wire is then vibrated 50,000 times through its operating cycle (right). Test results enable Hunter engineers to select the most economical wire and spring design for the purpose.

Wire Must be Uniform Where . . .

Accurate Measurement of Quality Shaves Costs On Precision Springs

Cost saving through exacting accuracy in design and production of precision springs is a specialty at Hunter Spring Company.

Over the past 25 years, its plant at Lansdale, Pa., has become a thought-center in the industry. Today, this center is becoming increasingly important to spring development for radio and television, electrical and gas appliances, automotive equipment, controls and hundreds of other applications.

To build springs with the precision demanded at Hunter requires assurance of a continuing supply of special wire with consistent and uniform high quality.

For this reason, Hunter produces a large share of its springs from specialty fine wire supplied by Johnson Steel and Wire Company. Take music wire, for example. Starting with sizes as small as .003 inch in diameter (about the thickness of a human hair), so fine that one pound contains over seven miles of wire, Hunter's requirements range upward to diameters as large as .150 inch.

In production of more common springs, Hunter often starts with Johnson's oil tempered M.B. high carbon spring wire in diameters ranging from .030 to .080 inch. It supplements this range with sizes from .080. to .500 inch, produced by experts at Johnson's parent Pittsburgh Steel Company.

As a measure of the importance of uniformity in the wire, consider the unique methods and equipment Hunter uses to design springs.

On rotating beam fatigue testers, developed by Hunter engineers, wire samples of predetermined length are looped through an arc and rotated at high speed. Studies of the number of cycles to failure indicate expected wire life in dynamic service. The life of springs made from this wire is compressed into a period of minutes by vibrating the spring through its entire operating cycle at high speed.

Test results of wire fatigue characteristics are correlated with those for the springs made from it. This enables Hunter to design springs for adequate service at minimum cost. Stress data for a complete range of wire and a wide variety of springs give Hunter research engineers an invaluable basic storehouse of information for economical design of springs. Yet, this information would be practically meaningless without dependable uniformity in the wire they are using.

Scientific quality control only begins with spring design, however. It is followed through with thorough inspection during production operations and a unique system for testing finished springs called "statistical quality control."

Hunter production facilities include modern high speed automatic coiling and torsion machines built to turn out precision compression, extension or torsion springs at machine-gun tempo. Special equipment is used to produce springs in a variety of intricate designs.

Secondary operations encompass grinding-of-ends on compression springs, forming-of-ends on tension or torsion springs, heat treating to relieve undesirable residual stresses

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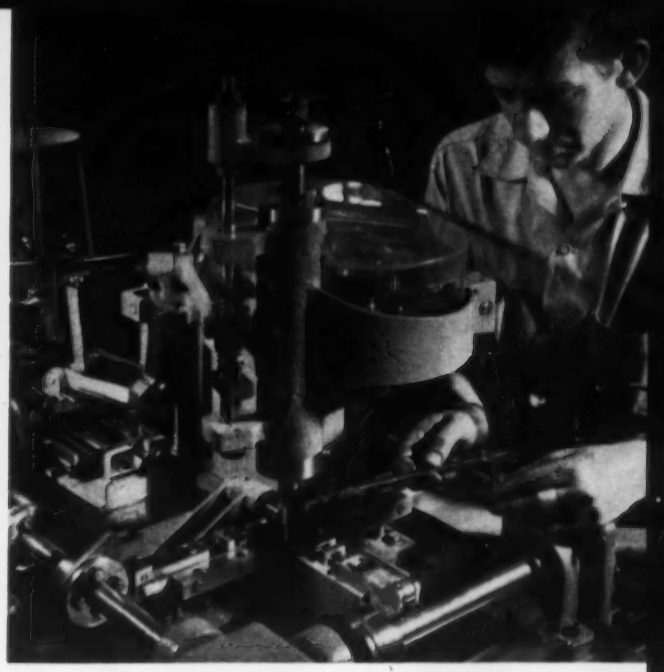

Production—Compression springs for high-quality locks made from .040-inch diameter Johnson music wire fly from this standard Torrington W-11 coiler at rates up to 5,000 an hour (left). The new Torrington No. 1 torsion machine equipped with multiple slides (right) is producing intricate refrigerator motor mounting torsion springs from .076-inch diameter music wire at rates up to 7,000 an hour. Each spring is precision built to exceed the life of the motor.

after cold working and plating or coating to resist corrosion—all accomplished on efficient up-to-date operating facilities.

To be scientifically sure that all of these factors, from the testing of wire through the design and production of springs, add up to the exact spring required by the customer, Hunter researchers now go to work again. Equipped with a complete line of testing apparatus for checking loads ranging from a few milligrams to 20,000 pounds, they test each shipment by (1) 100 per cent inspection, or (2) scientific sampling.

Delicate load testing equipment, for example, checks the amount of deflection in each spring. The piece-to-piece variation pattern in each shipment is sent to the customer in the form of a "statistical quality report." This report reduces inspection costs at the receiving end, provides a basis for decisions leading to changes in tolerance specifications, and assures the customer of receiving springs built for maximum performance at lowest cost.

Obviously, the success of this entire system is predicated on consistently uniform quality in wire from coil to coil and from shipment to shipment, even though the shipments may arrive at Hunter many months apart. To supply Hunter, Johnson Steel and Wire Company has geared production and testing techniques to meet these quality standards.

Do you use any of these specialty wires: Aircraft Cord, Armature Binding, Belt Hook, Bobby Pin, Brush, Gutterbroom, Card, Heddle, Shaderoller, Flexible Shaft, Hose Reinforcement, Hose, Mandolin, Piano, Rope, Safety Pin, Special Shaped, Staple, Metal Stitching, Signal Corps, Oil Tempered or MB Hard Drawn, Music Spring, or Tire Bead?

If so, why not take advantage of Johnson's long experience and modernized equipment to fill your requirements with quality wire you can depend on for uniformity? A call to our closest district office today will bring prompt attention!

Testing—Here delicate extension springs made from .009-inch diameter Johnson music wire to be used in record playing machines, are load tested. Under an initial tension of 8.44 grams, each spring is permitted a variation tolerance of only 1.23 grams (the weight of two paper clips). The variation pattern is sent to the customer in a statistical quality report.

Johnson Steel & Wire Company, Inc.

Worcester 1, Massachusetts

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The entire shell of the bucket on this 50-cu. yd. power shovel is fabricated from ¾" and 6½" "T-1" Steel Plate. Liner plates are made of ½" "T-1" Steel. "T-1" Steel Plate only 6½" thick has replaced large castings a foot thick in the lip of the bucket. Lighter weight construction with "T-1" Steel made it possible to increase the cubic capacity of the bucket by ten yards.

How USS "T-1" STEEL in big machines cuts weight, cuts cost, increases service life

Hanna Coal Company just can't afford to have this giant 50-cu. yd. shovel break down. This machine can move 2,280,000 tons of material a month, and it must operate continuously—24 hours a day, 7 days a week—to pay off.

Strong, weldable "T-1" Steel has improved the performance of this incredibly rugged machine, and it also has cut cost and weight. It enables the designers to use *fabricated* parts in place of larger, heavier, more expensive castings. And these lower-cost fabricated parts actually *last longer* than castings. As a result, Hanna Coal Company has standardized on "T-1" Steel for the vital parts of much of its heaviest-duty equipment.

Write for complete information on new USS "T-1" Steel. It has application in pressure vessels, rotating machinery, structural steel towers, steel mill equipment, big trucks, mine cars, and elsewhere.

WHAT'S "T-1" GOT?

AT HIGH TEMPERATURES. "T-1" has good creep rupture strength up to 900° F. and is being used with great success in heavy-duty, high temperature applications.

AT LOW TEMPERATURES. "T-1" is amazingly tough at temperatures far below zero . . . has withstood impacts of 2,000,000 ft. lbs. at 38 degrees below zero.

IN FABRICATION. "T-1" can be welded or flame cut without pre- or post-heating . . . and the welds develop the full 90,000 psi yield strength.

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USS

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These vertical furnaces, for example.

These furnaces permit the ultimate in temperature control and completely eliminate any possibility of distortion even when heating forgings, such as the turbine rotor shown, to temperatures as high as 1830°F!

Why did we install these furnaces?

Clair Koehler, a heater for 15 of his 31 years with us, can answer. "Large shafts stay straight as an arrow in these verticals. We get better temperature control, too. Total temperature variation is less than 10°F. from top to bottom."

Such laboratory-type precautions are typical of the care all forgings receive at United States Steel.

Address inquiries or requests for our free 32-page booklet on USS Quality Forgings to United States Steel, Room 4727, 525 William Penn Place, Pittsburgh 30, Pa.

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Quality FORGINGS

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Take a tip for safety's sake...

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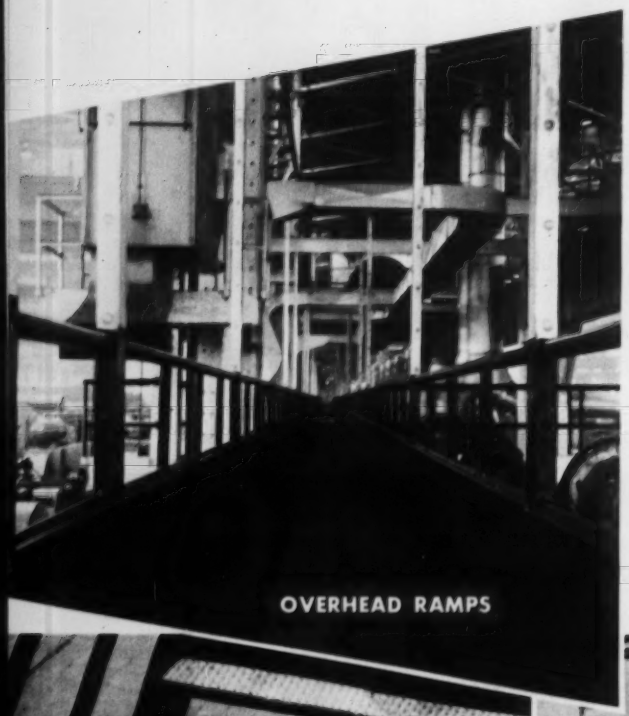

OVERHEAD RAMPS

DON'T WAIT until *after* a serious accident occurs! It will cost you less—in money and man-hours to safe-tread with USS Multigrip Floor Plate right now.

Then you'll know that your workers are protected from slips and falls at all times—even when the floor is wet or oily. For Multigrip safe-treading provides sure-grip traction from any direction for wheels as well as for feet. Be sure you don't overlook *any* potential danger spot, any area where a smooth surface may cause a slip.

Multigrip is easy to install . . . it is available in large sections so that you can reduce cutting time and waste when you want to cover large areas. Multigrip also is easy to keep clean, with broom or hose. There are no crevices to catch dirt . . . water drains quickly and completely.

Multigrip makes a long-lasting floor. This tough steel plate can take years of heavy traffic—and it won't crack, chip, splinter or rot as other flooring materials do. Multigrip can be used structurally or as a covering.

UNITED STATES STEEL CORPORATION, PITTSBURGH
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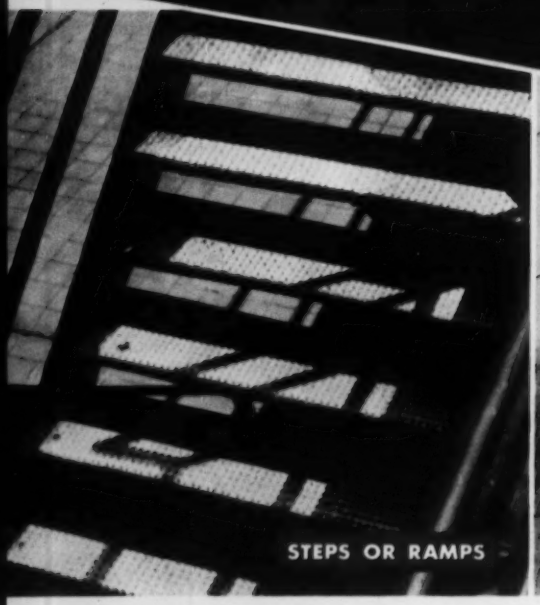

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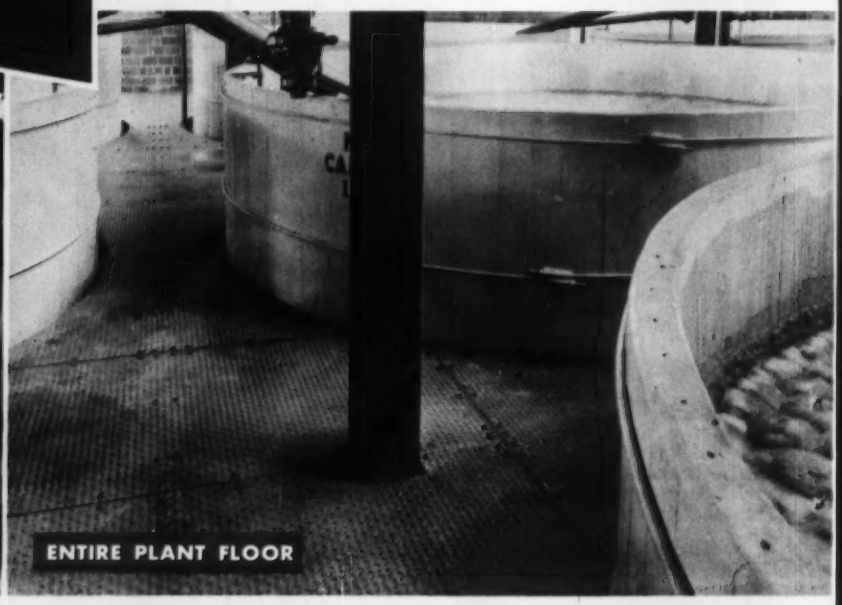

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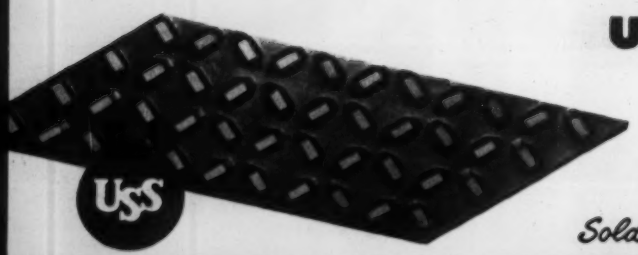

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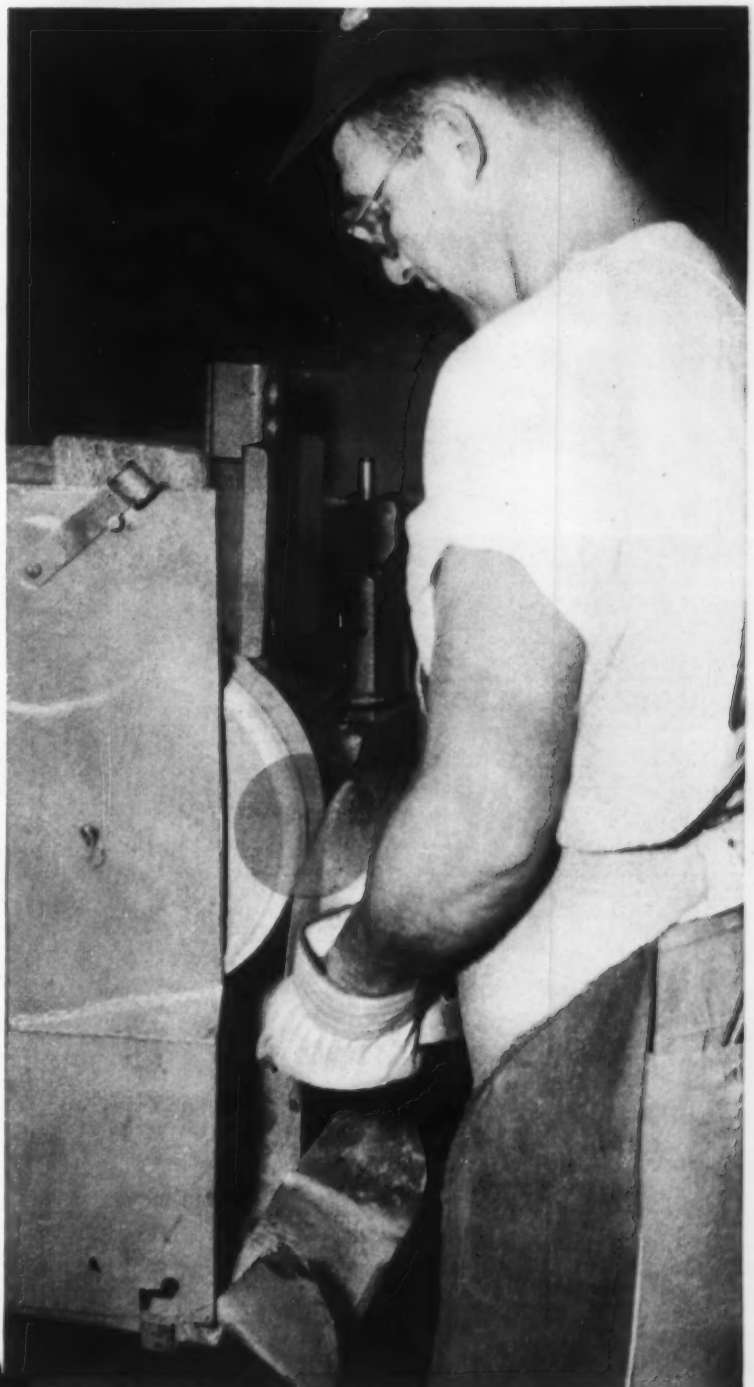

Here are the reasons why ALUNDUM B abrasive in your polishing set-ups will help each wheel last longer, produce more, and polish better:

Excellent cutting action. This development of Norton's famous ALUNDUM abrasive cuts fast, clean and cool — ideal for polishing jobs ranging from roughing to finishing.

Controlled uniformity. Grains are of uniform blocky shape. No flats, slivers or undersized grains to loaf on the job. No oversized grains to mar surfaces.

Maximum adhesion. Norton's special treatment for high capillarity keeps grains from pulling out before each has done its full share of work. Whether you use cement or glue, you get this same firm-clinging action that means longer, more productive wheel life.

Made in all grit sizes, from 20 through 240, to cover the widest range of polishing operations.

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BALANCED CUTTING OILS
WATER-MIX COMPOUNDS
KLEENKUT • SOLVOL • • EXCELENE • THREDKUT •

...is needed....

As the cutting tool meets the workpiece and chips start peeling off...lubrication and temperature control become of prime importance. More than a "coolant" is needed now to produce the optimum in production, finish and tool life. The cutting fluid must have superior lubricity, temperature control and chemical activity to properly eliminate scuffing of the tool and workpiece, reduce frictional wear and provide high anti-weld characteristics to prevent metallic seizure.

The D. A. Stuart Oil Company's modern laboratory is constantly at work developing industrial lubricants that are *just right for your job!* These include straight oil type cutting and grinding fluids, water-mix cutting and grinding fluids, drawing and stamping compounds, and lubricating oils and greases for gears, bearings and machine tool ways. For the best guide to the *right* industrial lubricant that will save you time, money and material, contact "the Man in the Barrel", your Stuart Representative. He knows how to solve your industrial lubrication problems. Fill in the coupon below today...ask to have him call.

3 STEPS TO SUPERIOR PERFORMANCE

To help you select the right industrial lubricant to do the best job. Consider all three carefully.

1. LUBRICITY

The characteristic of an industrial lubricant that reduces scuffing of the work and tool. Proper lubricity can eliminate rough finish, stop tearing of threads and sharp edges and promote proper chip formation.

2. TEMPERATURE CONTROL

Temperature regulation helps provide maximum efficiency—ignored, it can ruin efficiency. Excessive heat can change the character of a metal—temperature fluctuation will cause irregular chip formation or may even make it impossible.

3. CHEMICAL ACTION

Additives are introduced to industrial lubricants to produce super lubricity and anti-weld characteristics that prevent scuffing and seizure. However, chemical activity must be *carefully balanced* and *controlled* to meet job conditions and provide best results. Too much additive causes excessive wear . . . too little results in scuffing, seizure and rough finish.

THE Stuart TRIANGLE

Represents the pooling of experience and technical information from Stuart's Laboratory, field men and product users regarding the selection of the *right* cutting fluid to do the best job!

"The Man in the Barrel" knows how to obtain superior performance with industrial lubricants. When you're in doubt . . . contact Stuart Oil Company.

CLIP TO YOUR COMPANY LETTERHEAD AND MAIL TO

D. A. Stuart Oil Company
2735-37 S. Troy Street, Chicago 23, Illinois

☐ Please have Stuart Representative call.

☐ Please send copy of booklet titled Stuart's Cutting Oil Bases.

Name .....

Title .....

D.A. Stuart Oil CO.
EST. 1865 LIMITED

TIME-TESTED CUTTING FLUIDS AND LUBRICANTS

2735-37 S. Troy St., Chicago 23, Illinois
***In Canada:* Canadian D. A. Stuart Oil Co., Ltd.**
3575 Danforth Ave., Toronto

THREDKUT 99 • SUPERKOOL • CODOL • DASCO • STURACO E. P. LUBES

Wickwire!

THE QUALITY WIRE ROPE SLING

A sling is only as good as the wire rope from which it is made. Wickwire Wire Rope Slings are made from Wickwire Rope, the product of a company whose history goes back well over a century. This long experience in the design and manufacture of quality wire rope is applied to the fabrication of Wickwire Wire Rope Slings, making them worthy of the name "Wickwire." This means that Wickwire stands behind *every* sling it sells.

You benefit from our thorough knowledge and experience when you use Wickwire Wire Rope Slings. You are assured of materials of the highest quality. And in using wire rope slings, there can be no compromise with quality. Too much is at stake—the safety of the handling crew, possible damage to costly materials, and loss of productive time.

When you specify Wickwire Wire Rope Slings you get product responsibility that assures safe, efficient and economical service. Wickwire Slings are made from wire rope and fittings with matched rated capacities.

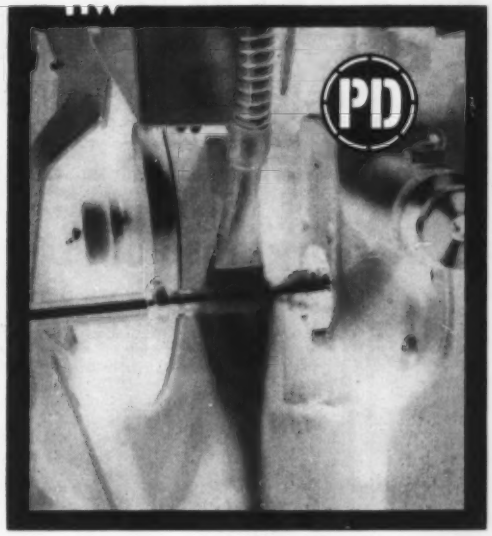
SEND FOR YOUR WICKWIRE SLING CATALOG TODAY

Just write us on your company stationery and we'll rush your copy to you—*free of charge and postpaid.* Our 120-page manual gives complete up-to-the-minute data, with hundreds of explanatory illustrations. It has a tough permanent cover, is fully indexed and handy to use. You'll find it indispensable for quick reference and helpful information when specifying the Wickwire Sling you need for the best in sling service.

2961

WICKWIRE
WIRE ROPE SLINGS
PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

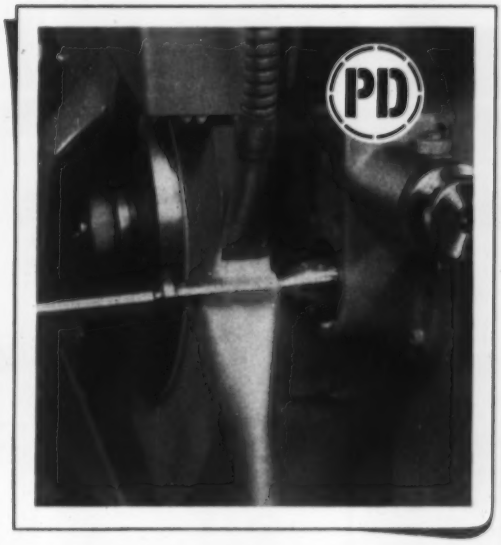
THE COLORADO FUEL AND IRON CORPORATION—Abilene (Tex.) • Denver • Houston • Odessa (Tex.) • Phoenix • Salt Lake City • Tulsa
PACIFIC COAST DIVISION—Los Angeles • Oakland • Portland • San Francisco • Seattle • Spokane.
WICKWIRE SPENCER STEEL DIVISION—Boston • Buffalo • Chattanooga • Chicago • Detroit • Emlenton (Pa.) • New Orleans • New York • Philadelphia



Save money and increase production through this remarkable development..

JUST AS A NEGATIVE guarantees you an exact duplication of a photograph each and every time, you are always assured a . . .

. . . POSITIVE DUPLICATION of an original grinding wheel each and every time through the CINCINNATI (PD) Manufacturing Process.



NOW!

Cincinnati Grinding Wheels offer

PD Positive Duplication

Here is the most talked about advancement in grinding wheels in years. And no wonder! Positive Duplication is an outstanding achievement in precision manufacturing and quality control that absolutely can *save you money* . . . and *increase your production.*

Through the CINCINNATI (PD) Manufacturing Process you are assured a Positive Duplication of the original wheel *every* time you reorder. "On grade" with a CINCINNATI (PD) WHEEL means all future (PD) WHEELS will act and grind exactly alike.

Yet CINCINNATI (PD) WHEELS *are priced no higher than ordinary wheels.*

We'll be glad to prove to you how CINCINNATI (PD) WHEELS can save you money and increase your production. Just contact us and we'll send one of our representatives—men who know grinding and grinding machines as well as grinding wheels. Write, wire or telephone Sales Manager, Cincinnati Milling Products Division, The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.

CINCINNATI *Grinding Wheels*

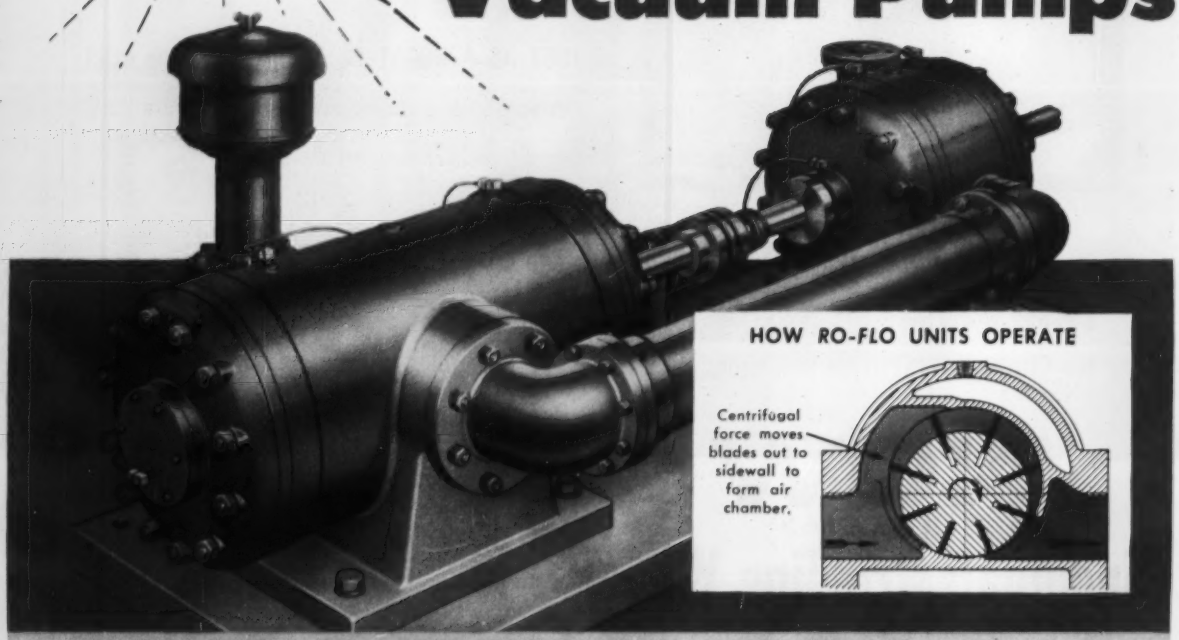
A PRODUCTION-PROVED PRODUCT OF THE CINCINNATI MILLING MACHINE CO.

ALLIS-CHALMERS

100-lb Compressors

0.3-in. Mercury Absolute Vacuum Pumps

NEW



FOR SHOP AIR • DRILLING • GAS HANDLING • VACUUM PUMPING

Now—the *Ro-Flo* line is extended to include high pressure as well as low pressure units to give you three important advantages:

Constant efficiency — Automatic compensation for wear is inherent in *Ro-Flo* design. During operation, rotor blades slide against the sidewall to form air cells. Any blade wear from this action is compensated for by the rotating force which holds blades in contact with the cylinder.

Simple foundation requirements — The smooth rotation of the *Ro-Flo* unit cuts vibration and eliminates need for heavy, expensive foundations.

Low maintenance — Shock and vibration, inherent in reciprocating machines, is eliminated. This cuts maintenance.

Two-stage *Ro-Flo* compressors can be furnished in any of 12 sizes to handle from approximately 250 to 1800 cfm at pressures from 65 to 125 pounds gauge. Vacuum pumps furnished from 200 to 5040 cfm at 29.7 inches Hg vacuum, with shut-off of 29.9 inches Hg, referred, or better. Single-stage units are built for pressures up to 50 pounds gauge, 65 pounds absolute. Single-stage pumps for vacuums up to 28 inches Hg referred.

A-4569

GET INFORMATION

Call your nearby A-C district office, or write Allis-Chalmers, Milwaukee 1, Wisconsin.

Ro-Flo is an Allis-Chalmers trademark.

A-C ALLIS-CHALMERS

ALLIS-CHALMERS

CALENDAR
OF MEETINGS

May 23-25, American Management Association: General management conference, Roosevelt hotel, New York. Association's address: 330 W. 42nd St., New York 36, N. Y. Vice president-secretary: James O. Rice.

May 23-25, American Society for Quality Control: Annual meeting and exhibit, Hotel Statler, New York. Society address: 50 Church St., New York 7, N. Y. Executive secretary: C. Eugene Fisher.

May 23-26, Machinery Dealers National Association: Annual convention, Netherland Plaza hotel, Cincinnati. Association's address: 1346 Connecticut Ave. N. W., Washington 6, D. C. Executive director: R. K. Vinson.

May 23-26, National District Heating Association: Annual meeting, Edgewater Beach hotel, Chicago. Association's address: 827 N. Euclid Ave., Pittsburgh 6, Pa. Secretary-treasurer: John F. Collins Jr.

May 23-28, American Foundrymen's Society: Annual meeting, Rice-Shamrock hotel, Houston. Society's address: Golf & Wolf Rds., Des Plaines, Ill. Secretary: William W. Maloney.

May 25-26, American Iron & Steel Institute: Annual meeting, Waldorf-Astoria hotel, New York. Institute's address: 350 Fifth Ave., New York 1, N. Y. Information: Frank Ragland.

May 30-June 1, National Association of Purchasing Agents: Annual meeting and exhibit, Waldorf-Astoria hotel, New York. Association's address: 11 Park Place, New York 7, N. Y. Secretary: G. A. Renard.

May 30-June 10, Canadian International Trade Fair: Exhibition Park, Toronto. Information: Director of the Trade Fair, Exhibition Park, Toronto, Ont., Canada.

May 31-June 1, National Rivers & Harbors Congress: National convention, Mayflower hotel, Washington. Congress' address: 1720 M St. N.W., Washington 6, D. C. Executive vice president: William H. Webb.

May 31-June 3, Basic Materials Exposition: Convention Hall, Philadelphia. Information: Clapp & Poliak Inc., 341 Madison Ave., New York 17, N. Y.

June 2-4, Electric Metal Makers Guild Inc.: Annual meeting, Hotel Fort Shelby, Detroit. Information: A. C. Ogan, secretary, Box 6026, Mt. Washington Station, Pittsburgh 11, Pa.

June 2-4, Steel Kitchen Cabinet Manufacturers Association: Annual meeting, the Greenbrier, White Sulphur Springs, W. Va. Association's address: 1008 Engineers Bldg., Cleveland 14, O. Secretary: Arthur J. Tuscany Jr.

June 5-8, American Gear Manufacturers Association: Annual meeting, the Homestead, Hot Springs, Va. Association's address: 1 Thomas Circle, Washington 5, D. C. Secretary: John C. Sears.

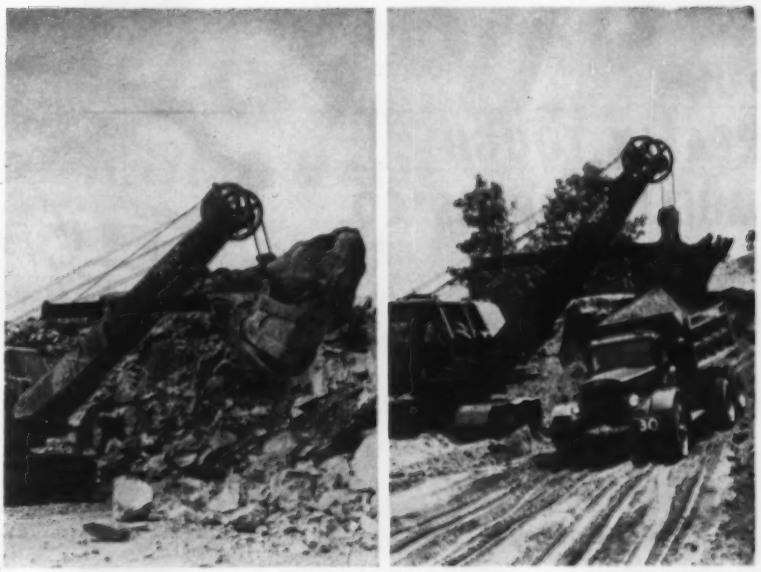
June 6-9, National Industrial Service Association Inc.: Annual covention and exhibit, Hotel Statler, Los Angeles. Association's address: 818 Olive St., St. Louis 1, Mo. Secretary: Fred B. Wipperman.

June 7-10, American Welding Society: National spring meeting and exposition, Municipal Auditorium, Kansas City, Mo. Society's address: 33 W. 39th St., New York 18, N. Y. Secretary: J. G. Magrath.

June 12-17, Society of Automotive Engineers Inc.: Summer meeting, Chalfonte-Haddon hall, Atlantic City, N. J. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: John A. C. Warner.

June 13-17, Technical Writers' Institute: Rensselaer Polytechnic Institute, Troy, N. Y. Information: Jay R. Gould, director, Technical Writers' Institute, Rensselaer Polytechnic Institute, Troy, N. Y.

June 13-17, American Society of Civil Engineers: Spring meeting, Jefferson hotel, St. Louis. Society's address: 33 W. 39th St., New York 18, N. Y. Secretary: Col. Wm. N. Carey.



Same equipment—different jobs

Should you change wire rope constructions?

Under normal conditions there is one best size and type of rope for every wire rope using machine. This is the one you use day in and day out on routine work. But what about other conditions, the tough job, the unusual job? Suppose abrasion becomes a bigger factor, or unusual strength is needed, or more flexibility? Is a change of rope type in order?

Take a power shovel, for example. Moving dirt, sand, gravel, ore, it works fast handling smooth loads. If it is on a long job of clearing large rock, however, it will move slower and receive heavy jars and shocks. A different Red-Strand wire rope construction will probably absorb the shocks better and last much longer.

Take *your* equipment for another example. Whatever your business and however you use wire rope—if unusual conditions arise call in your Leschen technical man. Leschen makes all types, knows the special advantages and qualities of every one, and can help you choose the rope that will do your job best—on shovels or any type of equipment. Leschen wire rope is working profitably in every industry.

Your Leschen man can easily be reached through your nearby Leschen distributor. See him soon.

Depend on Leschen's higher-than-rated quality for longer-than-expected service.

LESCHEN
HERCULES Red-Strand® WIRE ROPE
LESCHEN WIRE ROPE DIVISION
H. K. PORTER COMPANY, INC.
St. Louis 12, Missouri
HKP

FOUR *REALLY TOUGH* MUELLER BRASS CO. REFRACTORY BRONZE ALLOYS IN ROD FORM

"TUF-STUF" ALUMINUM BRONZE
"600" SERIES BEARING BRONZE
MANGANESE BRONZE
ALUMINUM SILICON BRONZE

These four Mueller Brass Co. alloys have been specifically formulated to meet the demands of applications where manufactured parts must stand up under the most adverse operating conditions. While these alloys are tough, they are relatively easy to machine. Parts made from these alloys are in dependable daily service and range from marine hardware to valve guides in aircraft engines. As specialists in brass and bronze alloys, the Mueller Brass Co. can offer you the exact alloy best suited to meet the requirements of any application problem. Write us today for details.

NAME OF ALLOY	ALLOY NO.	YIELD STRENGTH AT 0.5% EXTENSION LBS./SQ. IN.	TENSILE STRENGTH LBS./SQ. IN.	ELONGATION % IN 2 IN.	BRINELL HARDNESS	RELATIVE MACHINABILITY —FREE CUTTING BRASS = 100%	ALLOY CHARACTERISTICS
TUF-STUF ALUMINUM BRONZE	224-E	60,000	90,000	15	175	30	Resists oxidation and retains strength at elevated temperatures. Lightweight. Used in aviation industry.
TUF-STUF ALUMINUM BRONZE	224-C	62,000	95,000	9	185	35	Properties generally higher than 224-E. Non-Galling. Acid and corrosion resistant.
MANGANESE BRONZE—A	241-A	55,000	78,000	20	150	25	High torque resistance. Tough. For screw machine parts and forgings — valve stems, balls, airplane parts.
MANGANESE BRONZE (HIGH TENSILE—GRADE B)	721	68,000	115,000	10	200	35	Highest strength of the copper base alloys. Good shock and wear resistant properties. Used for rollers, rotors, valve stems.
FORGEABLE BEARING BRONZE	600	40,000	78,000	15	165	25	For use where excessive pounding action encountered. Excellent bearing properties. For bushings, gears, marine hardware, etc.
FORGEABLE BEARING BRONZE	602	40,000	74,000	12	150	65	Used with hard or soft mating members that do not have a high polish. Modification of 600 alloy—for use where difficult machining is necessary.
ALUMINUM SILICON BRONZE	802	45,000	90,000	15	175	65	Excellent machinability for high strength bronze. Corrosion resistant. For pole line hardware. Non-magnetic.

MUELLER BRASS CO. PORT HURON 19, MICHIGAN

149

DENISON *MULTIPUMP*

VARIABLE VOLUME VANE PUMP

DENISON MULTIPUMP gives you variable volume at constant speed plus constant volume at variable speed

NEW, EXCLUSIVE MULTIPUMP PRINCIPLE makes possible great savings in horsepower . . . by delivering only the oil needed by the circuit.

SIMPLE, UNIVERSAL CONTROL—in one compact unit—combines features available in other pumps only as optional items . . . and, in most cases, MULTIPUMP eliminates circuit components usually needed in addition to the pump itself.

FINGER-TIP CONTROL. Simple hand dial adjusts volume. Volume is maintained by MULTIPUMP regardless of variations in pressure and pump speed.

and in addition . . .

PRESSURE COMPENSATED, easily adjusted. Can be remotely controlled. Can be vented.

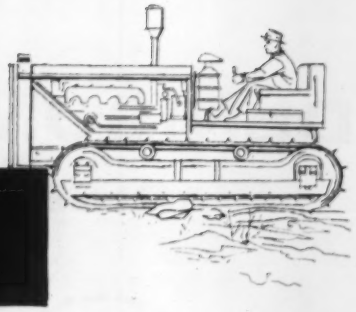
OPERATES COOLER. New Denison design principle circulates oil from tank at all discharge rates, even when pump is compensated.

SEND FOR FACTS. Operating characteristics, sizes and capacities of Denison MULTIPUMP are given in Bulletin 190. Write

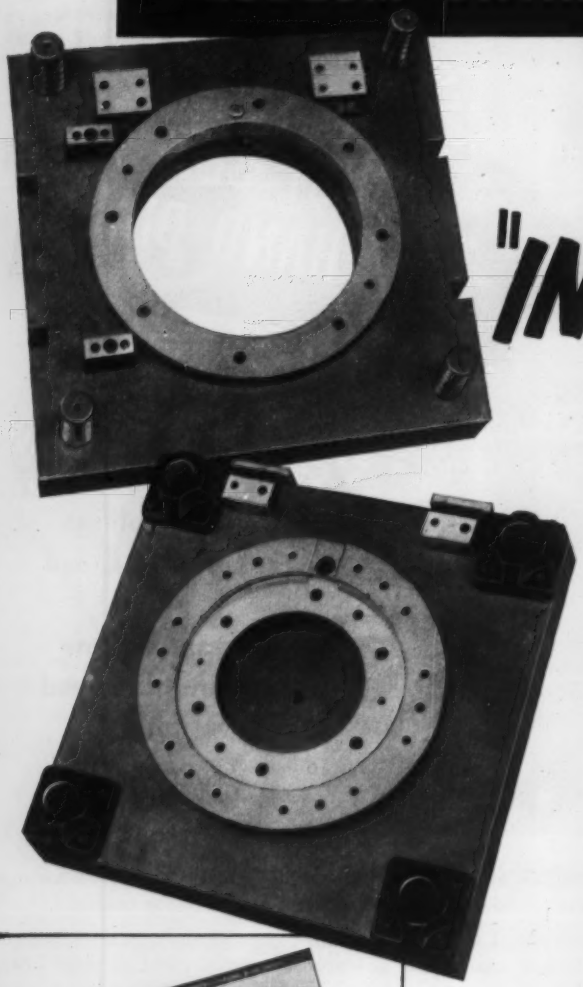
THE DENISON ENGINEERING COMPANY
1180 Dublin Road • Columbus 16, Ohio

DENISON *HydrOILics*

HYDRAULIC PRESSES • PUMPS • MOTORS • CONTROLS



LUDLUM ONTARIO DIE



comes through

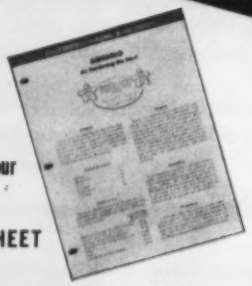
"IN THE CLUTCH"

A NATIONALLY KNOWN TRACTOR COMPANY used Ludlum ONTARIO dies to help reduce production costs. Ontario was given the job of blanking clutch plates from *high carbon* hot rolled steel .084" to .098" thick and 13½" wide.

EACH ONTARIO DIE BLANKED 220,000 clutch plates a year with only 11 resharpenings for an average of 20,000 pieces per grind!

AIR HARDENING ONTARIO PROVED IDEAL for this application because of its high abrasion resistance, high hardness and excellent non-deforming properties. It is tougher and easier to machine than higher carbon-high chromium types which are normally oil hardening.

ALLEGHENY LUDLUM METALLURGISTS can help solve your tool and die steel problems. Call your local A-L representative or distributor today . . . or write *Allegheny Ludlum Steel Corporation, Oliver Bldg., Pittsburgh 22, Pa.*



Write for your ONTARIO BLUE SHEET

This four page report discusses properties and characteristics of Ontario. It includes complete information on forging, annealing, tempering, etc. and detailed laboratory data on physical characteristics. *Ask for your free copy.*

Address Dept. S-651

For complete **MODERN** Tooling, call

Allegheny Ludlum

WAD 9331

AL® FINE TOOL STEELS SINCE 1854

EVOLUTION of MULT-AU-MATIC PROGRESS

Since 1914 the Bullard Mult-Au-Matic has reflected engineering and design progress required to fulfill industry's needs — until today, the Type "L", is the optimum for machines of its type.

Here are some of its features...

CONTROL SYSTEM

Advanced design of electro-hydraulic controls provide a readily accessible and simple control system for both Set-Up and Automatic machine operation.

FEED MECHANISM

Completely new screw type feed works insures smooth constant rate of advance of tool slides through any desired part of a 16" stroke with 81 feed changes ranging from .0025 to .0625.

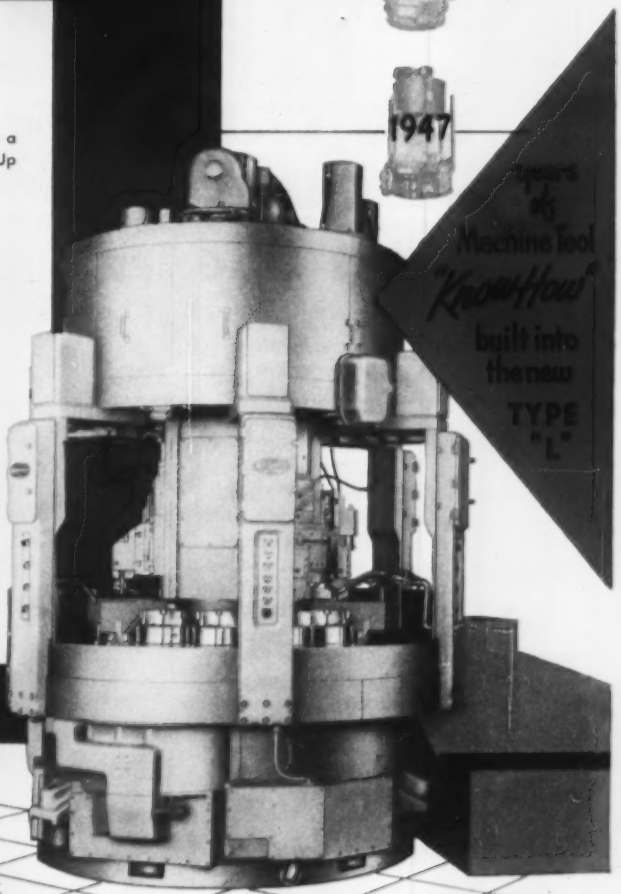
SELECTIVE SPINDLE SPEEDS

Range from 35 r.p.m. to 1,000 r.p.m. at each station providing the correct cutting speed to suit the specified operation.

CARRIER INDEX

The new indexing mechanism with improved carrier column bearing permits faster index of spindle carrier thereby reducing time between cuts. New design index mechanism registers and locks carrier, on successive indexes, to within ±.0005.

SEVENTY FIFTH BULLARD ANNIVERSARY



PLAN TO SEE OUR EXHIBIT AT . . .

THE MACHINE TOOL SHOW
CHICAGO, ILL.
SEPT. 6-17, 1955
INTERNATIONAL AMPHITHEATRE

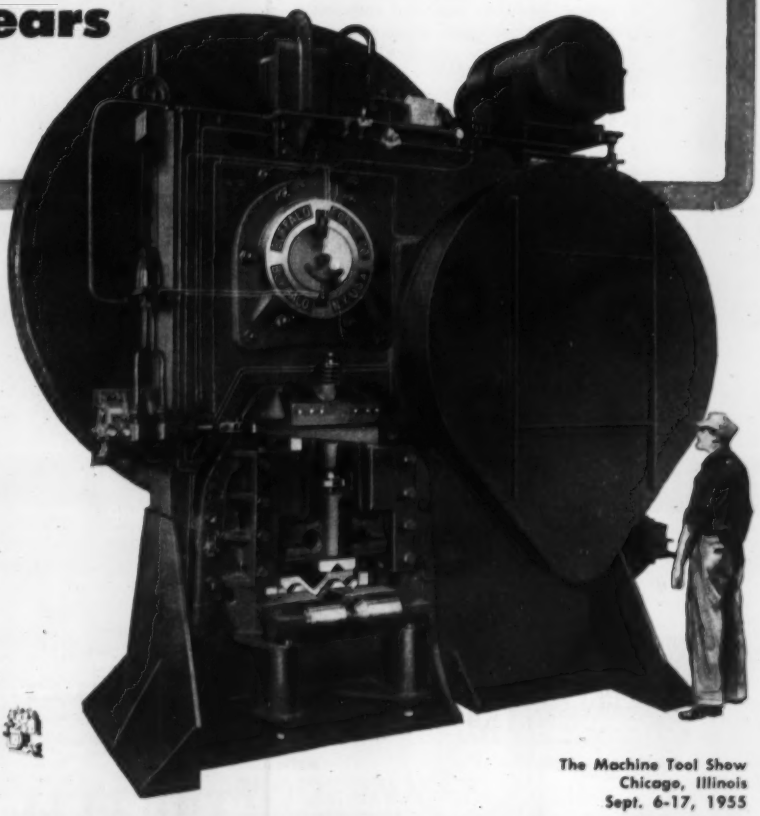
WE INVITE YOUR INQUIRIES CALL OR WRITE YOUR NEAREST BULLARD SALES OFFICE, DISTRIBUTOR OR . . .

MULT-AU-MATIC TYPE "L"
Available in three sizes
10" with 6, 8, 12 or 16 spindles, 14" and 18" with 6 or 8 spindles

THE BULLARD COMPANY
BRIDGEPORT 2, CONNECTICUT

ECONOMY in FORGING STARTS with the CUTTING!

YOU CAN STEP UP OUTPUT and QUALITY with "BUFFALO" Billet Shears



First, the high cutting rates of "Buffalo" Billet Shears step up your production. The big No. 17 at right shears six 9" squares or 10" rounds per minute, and speeds are correspondingly higher in our smaller models. Second, your cuts are clean, square and uniform. The knife penetrates only 3/16", localizing an accurate vertical fracture. *Write today for Bulletin 3295-B and see the "Q" Factor* features that make "Buffalo" Billet Shears your most economical and accurate means of preparing stock for forging.*

**The "Q" Factor—the built-in Quality which provides trouble-free satisfaction and long life.*

The Machine Tool Show
Chicago, Illinois
Sept. 6-17, 1955

ESTABLISHED 1877 "Buffalo" MEMBER N.M.T.B.A.

BUFFALO FORGE COMPANY

158 Mortimer St. Buffalo, N. Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

Drilling ● Punching ● Shearing ● Bending

Fast, low-cost tooling with compounds based on BAKELITE TRADE-MARK Epoxy Resins

Frequent model changes and tough competition demand quick tooling at less cost. Look into these advantages of BAKELITE Brand Epoxy Resins for metalworking tools:

- **Liquid compounds—can be cast to shape without pressure**
- **Cured at room temperature—no applied heat**
- **Minimum shrinkage—minimum finishing**
- **Excellent flexural, compression, and impact strengths**
- **Outstanding dimensional stability**
- **Light weight means easy handling**
- **Laminated with glass cloth to form jigs, spotting racks, fixtures, and Keller models.**

Ren-ite® Plastic tooling compounds cut costs on this job by four fifths! Delivery time was cut 70 per cent! Drop hammer dies for this press are made of compounds based on BAKELITE Epoxy Resins and produced by **Ren-ite Plastics,** Lansing 4, Mich. The dies stamp these trays out of 75 SO aluminum sheet.

BAKELITE BRAND EPOXY RESINS

BAKELITE COMPANY, *A Division of Union Carbide and Carbon Corporation* UCC 30 East 42nd Street, New York 17, N. Y.
In Canada: Bakelite Company, Division of Union Carbide Canada Limited, Belleville, Ontario
The term BAKELITE and the Trefoil Symbol are registered trade-marks of UCC

For Quick and Easy Cutting

SIMONDS "Red End" HACKSAW BLADES

All hands are top hands with a "Red End" Blade.

For Fast Service from Complete Stocks

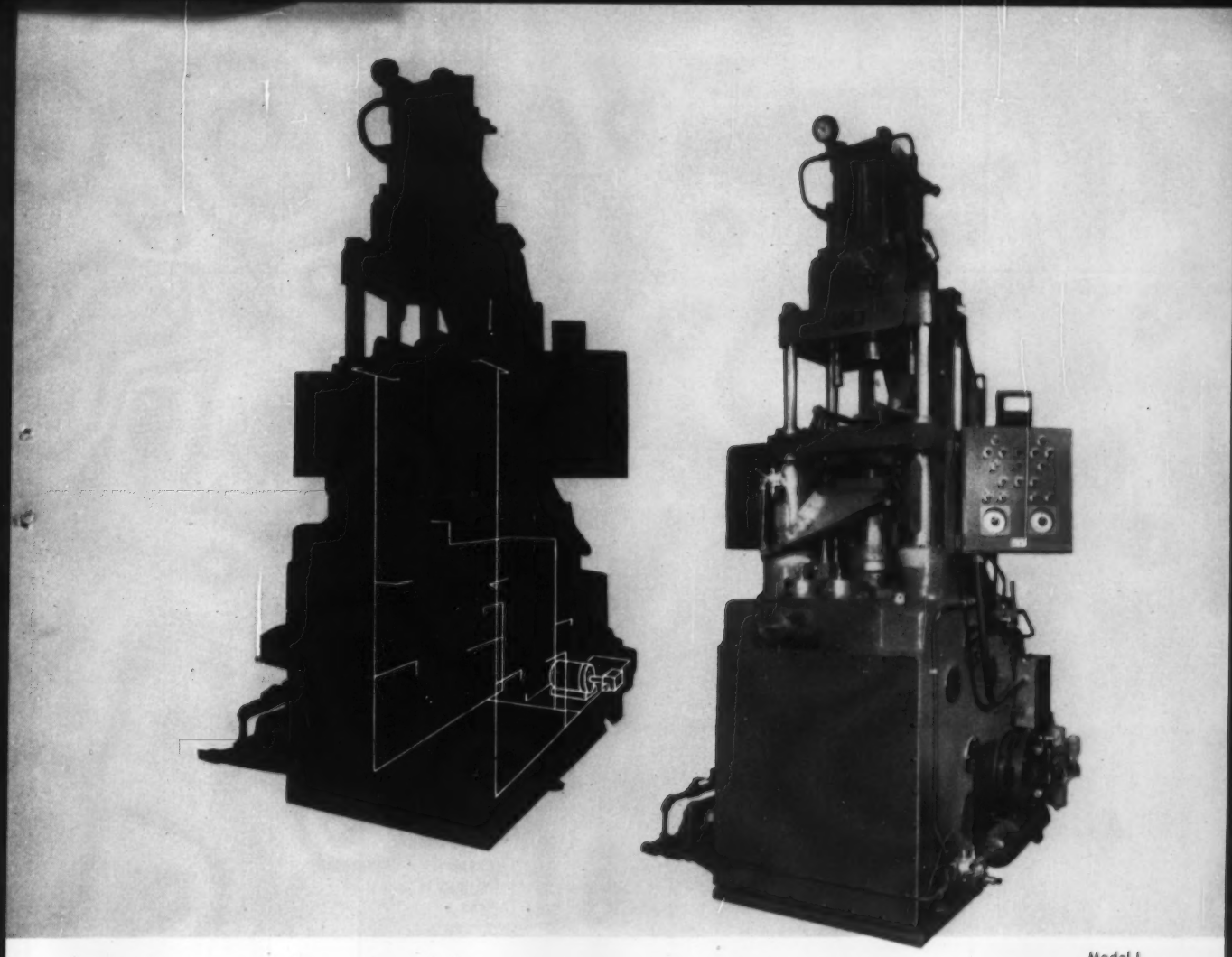
Call your **SIMONDS Industrial Supply DISTRIBUTOR**

There *is* a difference in hacksaw blades. A quality blade cuts faster, easier, straighter . . . gives more cuts per blade. That's why those who know, insist on Simonds "Red End" — the blade that's famous for quality.

Tough electric furnace steel, accurately milled and precision set teeth, scientific heat treatment and close production control are combined in these blades to give sharper, faster, longer lasting cut-ability to every blade. What's more, you have a choice of three types of blades for lowest cost and best results on different jobs: STANDARD STEEL for general purpose use; HIGH SPEED MOLYBDENUM for longer wear and greater resistance to breakage; HIGH SPEED TUNGSTEN for best results in cutting tough alloy steels. All blades come in 10 and 12 inch lengths and in standard tooth sizes with a choice of Hard Edge or All Hard. Specify "Red End" and get more for your hacksaw dollar.

SIMONDS SAW AND STEEL CO.
FITCHBURG, MASS.

Factory Branches in Boston, Chicago, San Francisco and Portland, Oregon
Canadian Factory in Montreal, Que. Simonds Divisions: Simonds Steel Mill, Lockport, N. Y.
Simonds Abrasive Co., Phila., Pa., and Arvida, Que., Canada



Model L

AUTOMATIC LUBRICATION protects new Baldwin powdered metal presses

Baldwin Model "L" and "C" powdered metal presses are just what you need for highest-quality and lowest-cost production. That's true because these new 50 and 100 ton presses are the first designed specifically for compacting metal powders.

A big reason why you'll get such low cost production is their automatic lubrication. In both presses a gear type oil pump, independently driven by a fractional horsepower motor, automatically lubricates all moving parts continuously. It forces filtered oil through a drilled crankshaft to the crank and connecting rod bearings. It pressure lubricates all other bearings subject to load.

Baldwin Model "L" and "C" presses are designed so that all moving parts are completely enclosed and sealed. Abrasive powder and dirt can't get into the bearings. These presses automatically fail to operate unless there is oil pressure in the lubricating system. An easily serviced oil filter provides further protection.

No other powdered metal presses have been designed just to meet your end product's needs. That's why Baldwin's new presses are your best buy. Only they can give you such uniform compacts and so little press maintenance because they both have automatic lubrication, hydraulic heads, shuttle type feeders, sealed mechanism, simple fill adjustments and variable cycling.

For more details about "L" and "C" please write to our Dept. 3846, Baldwin-Lima-Hamilton Corporation, Philadelphia 42, Pa.

BALDWIN BLH LIMA-HAMILTON

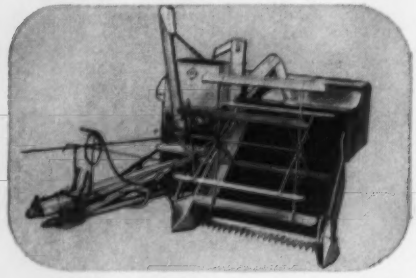
EDDYSTONE DIVISION

BALDWIN-LIMA-HAMILTON

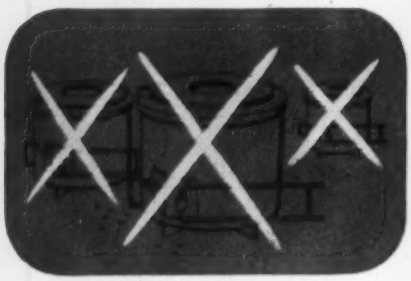
"Cyanide pots scratched . . . *LINDBERG* Carbonitriding Furnaces win in a walk!"

1. Owner, Allis-Chalmers, internationally known maker of farm machinery.

2. Allis-Chalmers purchased 3 Lindberg Carbonitriding Furnaces for its La Porte Works.



3. Furnaces used to heat-treat farm machinery parts—from a few ounces to 5 pounds.

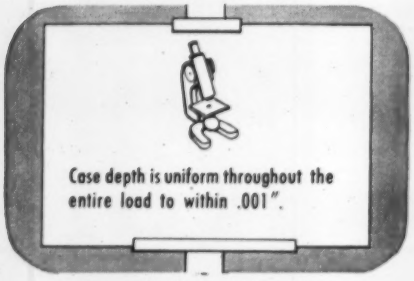


4. Old salt pots did not provide needed volume or desired uniformity of case depth.

WITH *LINDBERG* CARBONITRIDING FURNACES

One man does 5 times more than with salt pots.

5. This factor represents a tangible, specific saving in operating and labor costs.

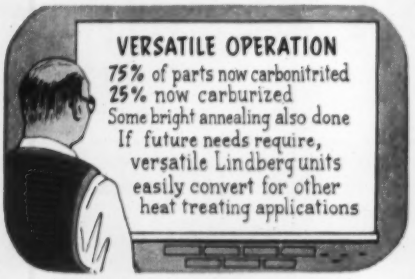


6. In addition to this advantage, working conditions were substantially improved.

NO SHOT BLASTING COST NOW

to remove frozen salt from fine threads tapped in parts . . . costly . . . high scrap rate.

7. Shot blasting eliminated . . . case depth requirements of .005 to .030 met.


VERSATILE OPERATION
75% of parts now carbonitrited
25% now carburized
Some bright annealing also done
If future needs require, versatile Lindberg units easily convert for other heat treating applications

8. Neutral hardening, carbon correction, tool treating—done with simple switch-over.

HOW ABOUT *YOUR* PLANT?

Perhaps we can help solve a production problem that will increase output, improve working conditions, and cut costs in your plant, too.

Write for our Bulletin No. 241.

LINDBERG *FURNACES*

LINDBERG ENGINEERING COMPANY

2441 W. Hubbard Street • Chicago 12, Illinois

40 YEARS
of quality metals . . .

1955 marks 40 years of quality alloys by Titan metal specialists. Brass and bronze free-cutting rods, extruded brass shapes, bronze welding rods, brass wire, aluminum and brass hand screw-machine parts, brass pressure die castings, brass, bronze and aluminum forgings are produced to meet high standards and rigid requirements. Titan Metal Manufacturing Co., Bellefonte, Pa. Offices and agencies in principal cities.

In the good old days

When the "Silver Campaign Depression" made it difficult to feed our horse, let alone meet the company payroll

when kitchen stoves were cast iron — and we made stove plate castings . . . when our first ads appeared in such well known magazines as:

HORSELESS AGE
AMERICAN MANUFACTURING
MODERN MACHINERY
THE GAS ENGINEER BULLETIN

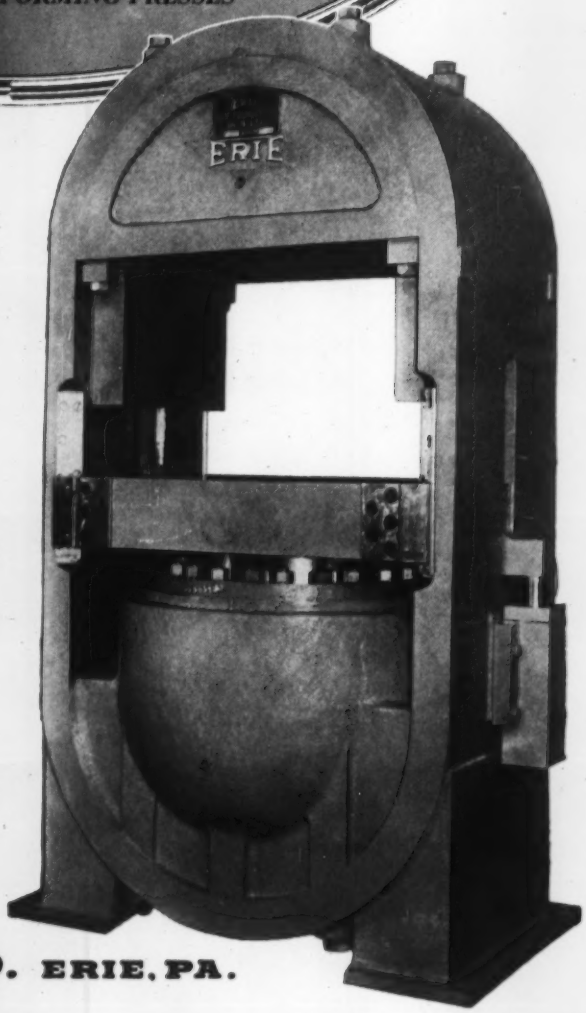
ERIE FOUNDRY WAS A GREAT NAME IN SPECIAL METAL-FORMING PRESSES

in today's modern metal working shop

When high labor costs mean more production per machine per hour to make a profit . . .

When exerting tremendous forces means faster shaping of metals . . .

When minimum deflection (less than .002") means almost perfect die matching . . . perfect parts . . .



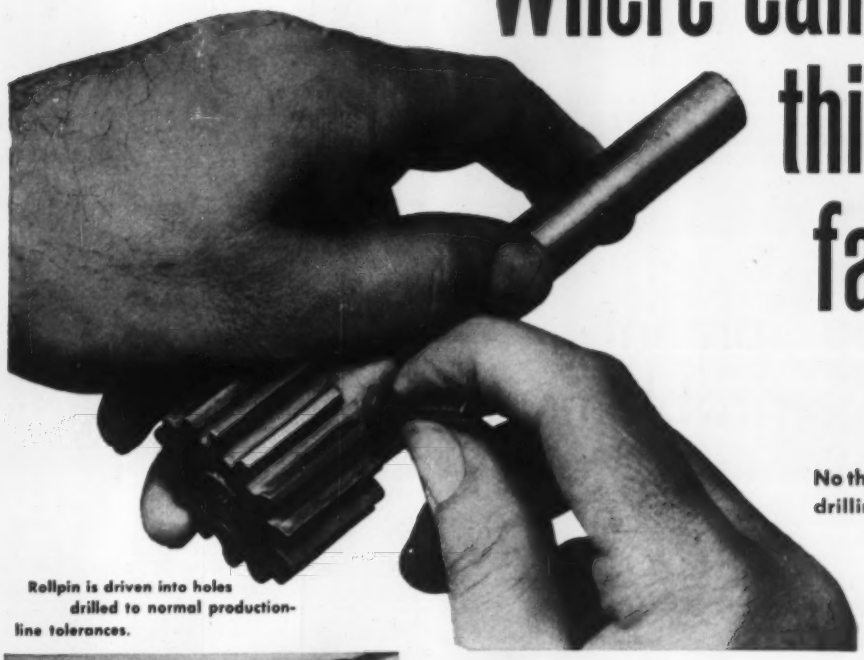
"IN OUR 60TH YEAR"

ERIE

is still the greatest name in special hydraulic metal-forming presses

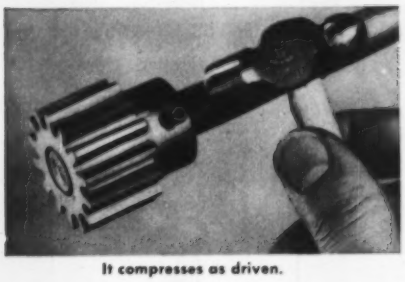
ERIE FOUNDRY CO. ERIE, PA.

Where can you use this simple fastener?

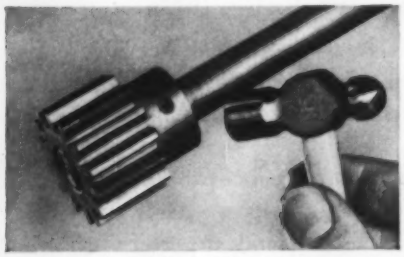


No threading, peening or precision drilling with ROLLPIN

Rollpin is driven into holes drilled to normal production-line tolerances.



It compresses as driven.



Rollpin fits flush . . . is vibration-proof.

Rollpin is the slotted tubular steel pin with chamfered ends that is cutting production and maintenance costs in every class of industry.

This modern fastener drives easily into standard holes, compressing as driven. Its spring action locks it in place—regardless of impact loading, stress reversals or severe vibration. Rollpin is readily removable and can be re-used in the same hole.

* * *

If you use locating dowels, hinge pins, rivets, set screws—or straight, knurled, tapered or cotter type pins—Rollpin can cut your costs. Mail our coupon for design information.

Elastic Stop Nut Corporation of America
Dept. R16-560, 2330 Vauxhall Road, Union, N. J.

Please send me the following free fastening information:

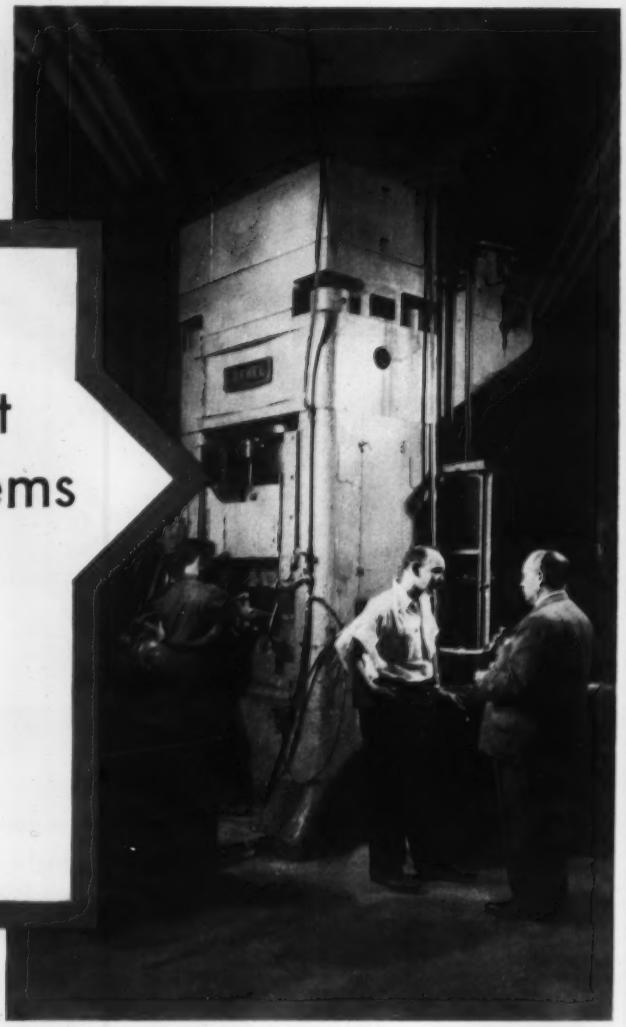
☐ Rollpin bulletin
☐ Elastic Stop Nut bulletin
☐ Here is a drawing of our product. What fastener would you suggest?

Name _____ title _____

Firm _____

Street _____

City _____ Zone _____ State _____



ease your hydraulic equipment maintenance problems with GULF HARMONY OIL

Use a hydraulic oil that has excellent resistance to oxidation, high film strength, outstanding rust preventive and anti-foam properties—qualities which hydraulic engineers consider to be the most important when selecting a hydraulic lubricant —and you will have fewer maintenance problems and less down time.

Gulf Harmony Oil has all of these qualities. It prevents the formation of sludge deposits and maintains its original viscosity over long periods of time. It also protects hydraulic equipment against excessive wear, even under severe conditions of pressure, speed, and temperature. And it protects against the damaging effects of harmful rust.

So if you have maintenance problems with your hydraulic equipment, call in a Gulf Sales Engineer. He will recommend the right grade of trouble-preventing Gulf Harmony Oil for your equipment. Contact him today at your nearest Gulf office.

GULF OIL CORPORATION
1822 Gulf Building

GULF

GULF REFINING COMPANY
Pittsburgh 30, Pa.

THE FINEST PETROLEUM PRODUCTS FOR ALL YOUR NEEDS

Capsule Case History:

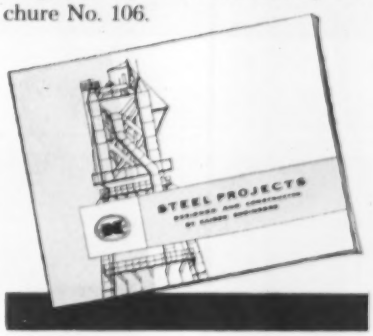
See yourself as others see you...

Many major firms have employed Kaiser Engineers to analyze their present problems and appraise future needs and prospects. Kaiser Engineers is particularly well qualified to provide this fact-finding service, for it has a wide diversity of talents to prepare engineering and economic feasibility reports, market and site location studies.

Like a Full Cut Diamond
the making of steel has many facets, presenting a variety of problems to management contemplating expansion or modernization. These problems can be simplified by a comprehensive study prepared by Kaiser Engineers. For example, an eastern steel mill was shown how to improve and increase its sintering facilities and at the same time provide for expansion.

Whether you plan to build or expand, a KE study will provide you with facts in advance.

Write today for your copy of Kaiser Engineers' new steel industry brochure No. 106.



kaiser engineers ...for low operating costs

DIVISION OF HENRY J. KAISER COMPANY

ENGINEERS K CONTRACTORS

• HOME OFFICE: KAISER BUILDING, OAKLAND 12, CALIFORNIA (CABLE: KAISENGS) NEW YORK, PITTSBURGH, WASHINGTON, D.C.
• HENRY J. KAISER CONSTRUCTION CO. • HENRY J. KAISER COMPANY (Canada) LTD., MONTREAL • KAISER ENGINEERS INTERNATIONAL, INC.

STANDARD
technical service clicks at Argus Camera

Personnel at Argus Camera Company were having trouble with the grinding of thread plug gauges. Grinding oils used failed to hold the required accuracy. They called in L. H. Walker, Standard Oil industrial lubrication specialist. He recommended Standard's SUPERLA Thread Grinding Oil A, and Argus began using it. That was four years ago. What happened? SUPERLA Thread Grinding Oil has helped Argus grind thread plug gauges with such accuracy, so consistently, rejects are virtually eliminated.

Small job? Yes. Small volume of oil used? Yes. But the results are big business to Argus Camera. That makes it important to Standard Oil. It is another demonstration of what this unbeatable combination can do when put to work:

1 Standard lubrication specialists capable of giving technical help.

2 Top quality products *that deliver results required.*

Put this combination to work in your plant. In the Midwest there is a lubrication specialist in your nearby Standard Oil office ready to help you. Call him. Or contact Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD

STANDARD OIL COMPANY
(Indiana)

Omer L. Parks (left), tool and gauge grinder for Argus Camera, inspects thread plug gauge with L. H. Walker, Standard Oil industrial engineer. Lyman Walker has been working with customers for 25 years helping them solve problems like the one at Argus. A native of Detroit, Lyman Walker is familiar with the lubrication problems of industry in the territory he serves. This together with his wide experience makes him ideally qualified for this work. Customers find his experience pays off for them.

Q. Why does Blanchard grind its own machine parts on a Blanchard?

A. It's the only way we know to get highest quality at lowest cost!

Shown here are 117 different parts of a #18 Blanchard Grinder. 239 surfaces on these 117 parts were ground on a Blanchard, for the simple reason that *there isn't any better way.*

Everyone who uses Blanchard Grinders knows that Blanchard elements are machined with extreme accuracy . . . that they *have to be!*

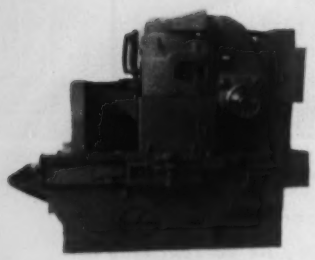
Furthermore, Blanchard users everywhere would undoubtedly agree fully with these two actual statements recently made by customers:

"There is no greater machine tool money value than a Blanchard. It is the best buy we ever made".

"Until our Blanchard went to work, I never realized I could actually save so much, as compared to previous methods of machining flat surfaces".

If you do not own a Blanchard, we invite you to select some of your own components, and let us give you estimates to compare with your present quality control tolerances and machining costs. Chances are you'll find it will pay you to ***"PUT IT ON THE BLANCHARD".***

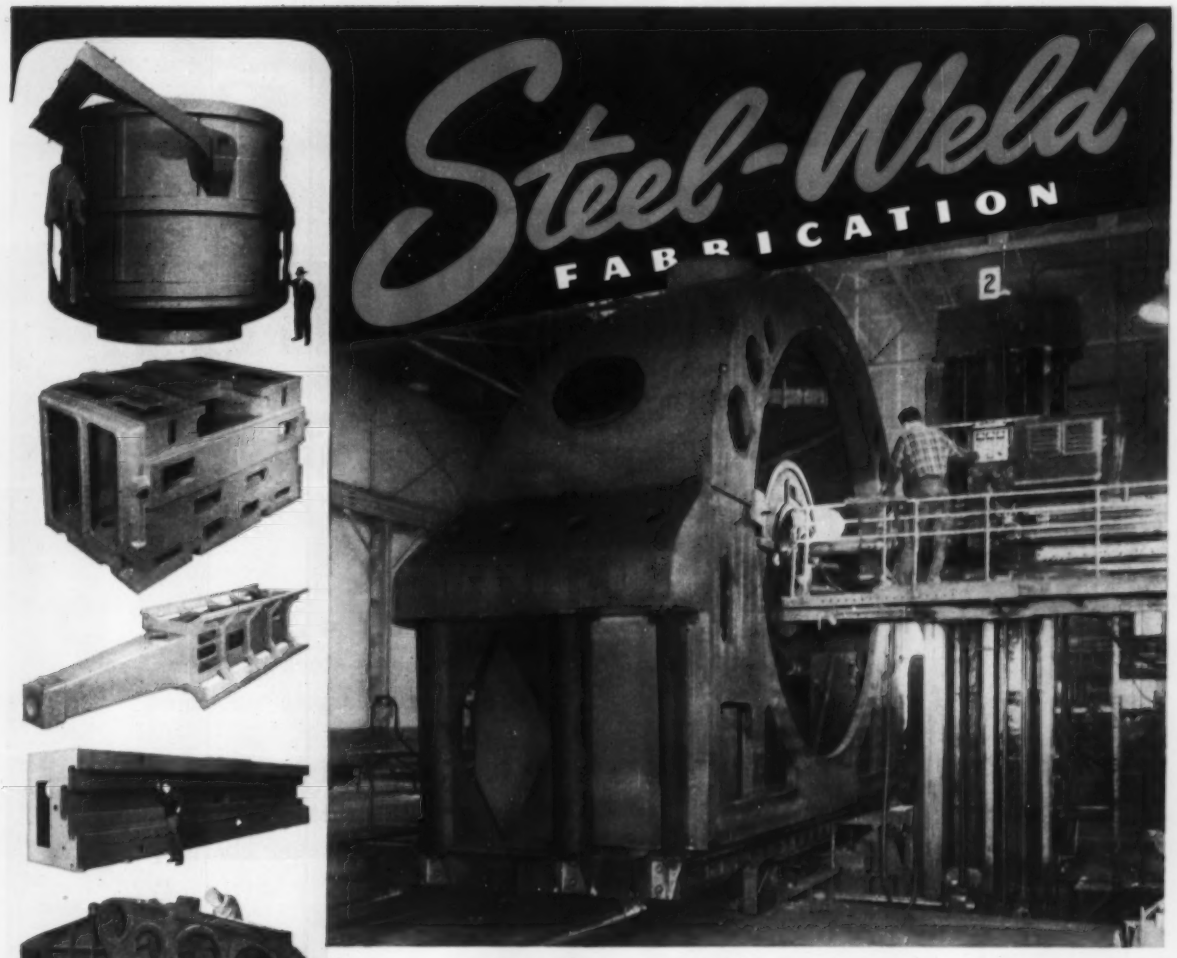
P. S. You guarantee yourself full benefit from your Blanchard Grinders when you use the correct Blanchard abrasive wheels!



Send for free copies of "Work Done on the Blanchard", (fourth edition), and "The Art of Blanchard Surface Grinding".

PUT IT ON THE BLANCHARD

THE BLANCHARD MACHINE COMPANY 64 STATE ST., CAMBRIDGE 39, MASS., U.S.A.



Use WELDED STEEL for Greater Strength with Less Weight!

Precision machining operations on heavy cumbersome pieces, such as the base and cover of a 200,000 kw Steam Turbine illustrated above, are not uncommon in the Steel-Weld Division of the Mahon Company. Mahon service to manufacturers of processing machinery, machine tools, and other types of heavy mechanical equipment is complete in every respect: Design-engineering, Fabrication, Magnetic and Radiographic Inspection, Stress Relieving, Grit Blasting, Machining and Assembling. If you use weldments in your product, or if parts of your product could be produced to better advantage in welded steel, you will find in the Mahon organization a unique source . . . a source where design skill and advanced fabricating technique are supplemented by craftsmanship which assures a smoother finer appearing job embodying every advantage of Steel-Weld Fabrication. See Sweet's Product Design File for information, or write for Booklet showing Mahon facilities and capabilities in this field.

THE R. C. MAHON COMPANY
DETROIT 34, MICHIGAN

Engineers and Fabricators of Steel in Any Form for Any Purpose

MAHON

DO YOU NEED STEEL FAST ?

If you're in a hurry for plain or fabricated steel, Levinson can take care of your requirements from stock. Levinson's stock of beams, channels, angles, plates, sheets and bars is the largest and most comprehensive in the company's history.

Levinson can take care of your order for almost any size and almost any quantity right now **at regular established prices.**

Levinson has had a long-standing policy of never charging premium prices during steel shortages.

Call, write or wire Levinson today.

Warehousers, fabricators, designers of steel for over half a century.

the LEVINSON STEEL COMPANY

22nd & Wharton Streets, Pittsburgh 3, Pa.
Phone HUbbard 1-3200

OPEN FOR BUSINESS

"SAND SCREEN's" unique open-mesh construction lets removed material flow *right through*... instead of loading or glazing, like conventional paper and cloth. What's more, *both* sides are usable—give you 7 to 15 times longer life. Use "SAND SCREEN" wet or dry, by hand or machine. It tears and folds easily to any desired size. Cut sheets fit oscillating or vibrating machines. "SAND SCREEN" Discs give best results when used wet with CARBORUNDUM'S FASTCUT® Pad 85 Assembly. Try it—see how it slashes polishing and finishing costs in your shop. For a free sample, call your CARBORUNDUM Distributor or salesman, or write The Carborundum Company, Niagara Falls, N. Y. In Canada: Canadian Carborundum Company, Ltd., Niagara Falls, Ont.

Through product quality and application "know-how"

CARBORUNDUM

REGISTERED TRADE MARK

continually puts more sense in your abrasive dollar

Nary a slip 'twixt the job and the disc

PHOTOGRAPHED AT MORRISON STEEL PRODUCTS, INC.

One look at this new Resin Sander Disc by CARBORUNDUM tells you it's no sissy. One trial in your shop *proves* how tough it is. It bites into metal fast...cuts free and cool...stays sharp from start to finish. The rugged all-fibre backing, plus a resin bond with greater holding power, means far more work per disc. The edge holds shape longer, even on your most severe grinding jobs. Resin Sander Discs are designed for both snagging and surfacing operations, come in types and sizes to fit all Disc Sanders.

For a free demonstration of this new cost-cutter, call your CARBORUNDUM Distributor or salesman today. Or write The Carborundum Company, Niagara Falls, New York. In Canada: Canadian Carborundum Company, Ltd., Niagara Falls, Ontario.

Through application "know-how" and product quality

CARBORUNDUM

REGISTERED TRADE MARK

continually puts more sense in your abrasive dollar

BLISS & LAUGHLIN'S

NEW STANDARD OF QUALITY

B L

LUSTERIZED*

COLD DRAWN FINISH

SEE IT
BUY IT
TRY IT

COLD FINISHED CARBON AND ALLOY STEEL BARS

*LUSTERIZED PROCESS Pat. Applied for

BLISS & LAUGHLIN, INC.

GENERAL OFFICES: HARVEY, ILLINOIS

SALES OFFICES IN ALL PRINCIPAL CITIES

FOUR PLANTS:—

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DETROIT, MICH.

BUFFALO, N. Y.

MANSFIELD, MASS.

Ryerson tubing experts help you select from world's largest stocks

Seamless or welded? Hot or cold rolled? Round or square? Whatever the type, size and wall thickness—you get what you need, quickly, when you call Ryerson for tubing.

That's because our tubing stocks are so large and diversified—are, in fact, the nation's largest. And because we have *a tube for every use* you can be sure of completely unbiased recommendations when you consult Ryerson specialists on tubing problems.

Other advantages of Ryerson tubing service: You deal with an organization that knows steel in all its forms and formulas, and you can save time by ordering every steel requirement from the same source.

You can rely on Ryerson for prompt personal attention—for quality steel accurately cut to specification—for quick delivery from stock. So, when you need tubing—and any other steel product—call Ryerson.

In stock: Bars, structurals, plates, sheets, tubing, alloys, stainless, reinforcing, machinery & tools, etc.

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CHARLOTTE, N. C. • CINCINNATI • CLEVELAND
DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

Metalworking Outlook

Guaranteed Weekly Wage?

General Motors and Ford reportedly have offered a guaranteed weekly wage to counter the guaranteed annual wage plan. The weekly proposal would be a guarantee of 40 hours of pay to any employee legitimately reporting for work on Monday. Interestingly, the United Auto Workers accepted such a deal in February with a small, Fenton, Mich., company. The union originally demanded the full GAW from the firm. UAW spokesmen are hastening to explain that agreement was "definitely no pattern setter."

Chrysler Prods Dealers

Chrysler Corp.'s Chrysler Division is urging its 3100 dealers to order the rest of their expected 1955 model needs before July. The reason: It wants to schedule its production before the 1956 model changeover in October. The division is switching some operations into a Detroit plant addition which will increase its capacity to 1200 cars daily.

Reversal on Welfare Funds

Both the AFL and CIO will back legislative proposals for mandatory disclosure of data on receipts and dispersals for welfare funds. That's a reversal of labor's former hands-off policy. It's a defensive move as criticism of union stewardship mounts.

Hoover Reports on U.S.-in-Business

One thousand of some 2500 business facilities being operated by the Defense department could be eliminated without injuring our national defense or any essential governmental function. So says the Hoover Commission which reported 22 recommendations to Congress for getting the U.S. out of competition. Examples of its findings: Although the armed services process not more than 15 per cent of their scrap, they have nine aluminum sweating and 27 scrap metal baling and processing facilities; the services also own 288 large industrial facilities which cost $200 million annually to maintain. Prospects for congressional action aren't bright in this session.

Stockpile: Eight Materials Short

Eight materials still are seriously short of stockpiling objectives, says Defense Mobilizer Arthur Flemming. He won't say what they are, but they probably include metals like nickel, selenium and titanium. The stockpile program eventually may involve acquisition of materials worth about

$10 billion. The present value is about $5 billion and is being increased at the rate of $800 million annually.

Shortage in Fuel Oil

A large oil company is moving 2.5 million barrels of fuel oil from California to the East Coast. The industrial boom is causing a shortage there and in the Middle West. The demand, plus unusually high transportation charges for many oil firms, has boosted the price about 2 cents.

Can't Wait for the Seaway

Exporters and importers from the Great Lakes area aren't waiting for the St. Lawrence Seaway. More and more are using the smaller ships that are sailing to Europe and the Caribbean. Seventy of them served Lake Erie ports in 1954. Eighty-three will be calling this season. At Toledo, O., about 70 per cent of the exports are petroleum products; 82 per cent of the imports are machinery.

New Steel Plant in Bremen

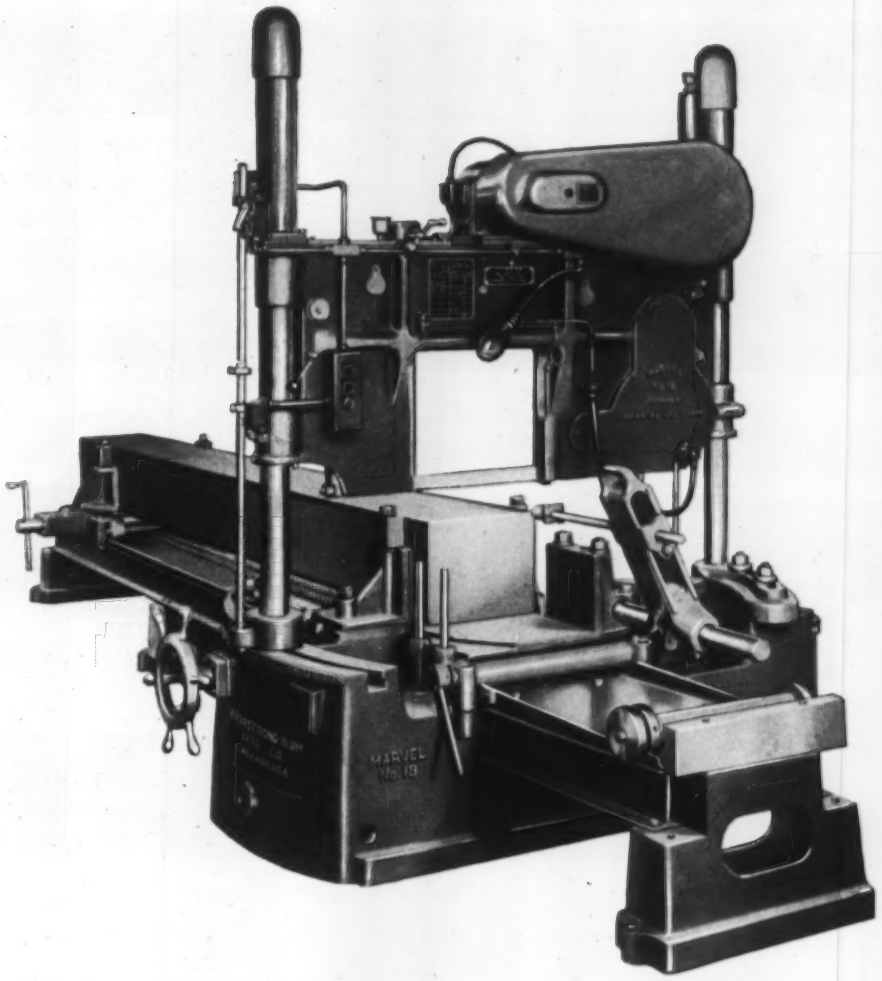
The Klockner firm, second largest German steel company, plans to build a 2-million-ton integrated plant in Bremen. "A continuous strip mill for the plant will be bought in the U.S.," says Fritz Berendsen, director. The German steel industry is on the verge of a ten-year expansion program (page 57).

Straws in the Wind

The Senate Interior Committee has approved a bill calling for continued government buying through 1968 of seven domestically mined ores— tungsten, manganese, chromite, mica, asbestos, beryl and columbium-tantalum . . . An Atomic Energy Commission official says it will take from five to ten years to build an atomic-powered merchant ship that can compete economically with conventional vessels . . . The Ford Foundation says the earliest it may sell Ford Motor Co. stock is late this year . . . Ben Fairless, who early this month retired as chairman of U.S. Steel Corp., was elected a director of the Pittsburgh Consolidation Coal Co.

This Week in Metalworking

Move cautiously on price cutting, sheet metal distributors warn (page 58) . . . The accent on continuous mining at the American Mining Congress' exposition proves that there's automation in the coal industry, too (page 59) . . . July will be the peak month for metalworking vacations (page 60) . . . Industrial furnace sales are heating up (page 61) . . . Business this year for steel foundries will bounce back to 1953 levels (page 62) . . . Smaller firms are doing more research, and 400 commercial laboratories are helping them do it (page 63) . . . Inland waterway traffic has nearly tripled in a decade (page 68).



No Job too big or too tough . . .

for MARVEL "*Giant*" Hack Saws

These giant MARVEL Hydraulic Hack Saws (No. 18, Capacity 18" x 18"; and No. 24, Capacity 24" x 24") were *basically* designed for rapid and economical cut-off of BIG WORK. They are not merely "conventional" designs "stretched" to big capacity. They are truly designed and built with the ruggedness and rigidity necessary to withstand the rough treatment of sawing big work, even though the work is in the "toughest of the tough" alloys.

They are reliably fulfilling the cut-off requirements in innumerable steel mills, forge shops, structural shops, warehouses, and machine shops, with assured low tool cost and minimum kerf loss of steel.

In addition to cutting-off, they are reducing costs by eliminating further machining operations. Heat treated die blocks are being reclaimed for re-sinking by sawing off the worn face; columns, beams, pipe, and tubing are being sawed to *finished*, square ends, eliminating milling; angular sawing is done conveniently by swinging the upper structure on the base, to any angle up to 45 degrees—*without moving the work*.

Contemplating the modern trend toward ever tougher steels and larger sizes, these are the logical sawing machines to buy, not only for today's needs but for tomorrow's as well.

Write for Catalog

Metal Cutting MARVEL SAWS
Better Machines—Better Blades

ARMSTRONG-BLUM MFG. CO. 5700 West Bloomingdale Avenue • Chicago 39, U.S.A.

Three Types of Kirksite melting pots produced in long-wearing nickel alloyed cast iron which is resistant to the moderately elevated temperatures encountered. Made by Apex Steel Corp., Ltd., a specialist in producing pots used for melting non-ferrous alloys.

Melting Pots that last for years

Read how nickel chromium cast iron increases service life

HERETOFORE pots used for melting Kirksite (a zinc base alloy) went bad in a matter of months. Thermal checking and corrosive action of the molten alloy caused the most failures.

Today, however, use of nickel chromium cast iron has increased the life of these melting pots by 300 to 400 per cent. Depending upon heat cycle and severity of the service.

Now, two or three years life is common. And under optimum conditions their life is even longer.

This great improvement stems from experiments made by the Foundry and Machine Division of Apex Steel Corporation, Ltd., Los Angeles, California, together with INCO.

After trying various alloyed compositions, results obtained jointly by these companies show the correctness of standardizing on nickel chromium cast iron.

If you have a metal problem . . . whatever the troublesome factors involved . . . lets talk it over. Draw on our vast fund of useful information. Take the first step now . . .

Write for "List A" of INCO publications. With it comes a simple form for outlining your difficulties. We'll be glad to send you suggestions based on our wide practical experience. Write us today.

INCO
TRADE MARK

THE INTERNATIONAL NICKEL COMPANY, INC. 67 Wall Street New York 5, N. Y.

Share the Atom

Peacetime applications of the atom promise a rich and untapped source of business for American industry.

Until Congress passed the Atomic Energy Act of 1954, industry had little incentive or opportunity to learn about the atom and its use. The government maintained a monopoly.

Now industry can own nuclear reactors for commercial purposes. It can own nuclear fuels for use in reactors. It can patent inventions in the nuclear field. It can obtain classified information for commercial purposes.

This new government-industry partnership already is proving its worth. Atomic developments are coming along faster than atom splitters dared to dream they would 15 years ago.

The time scale for atomic nuclear power development has been cut ten years. The first nuclear-powered submarine, *the USS Nautilus,* will be followed by *the USS Seawolf,* with a more advanced power plant. Shipbuilders are studying designs for atom-powered ships for the Navy and the application of atom power to commercial ships. Similar power plants are projected for locomotives and aircraft.

Electric power generating plants shortly will be a reality. Their proponents point out that a saving of only 1/10-cent per kilowatt-hour would save the nation $430 million annually.

Radioisotopes used as a source of radiation in inspection and measuring devices are saving industry $100 million a year—rejects are reduced; quality is improved.

Many studies of applications for the atom will affect industry profoundly. For example, the use of gamma radiations to preserve food may revolutionize an entire industry.

Here's how you can share in the benefits of the atom:

—Set up an individual or group to learn more about it. They can study current literature or take an Atomic Energy Commission course in reactor technology. Contact Industrial Liaison Branch, Division of Reactor Development, AEC, Washington 25, D. C.

—See whether your facilities are suitable for taking on prime AEC contracts or subcontracts.

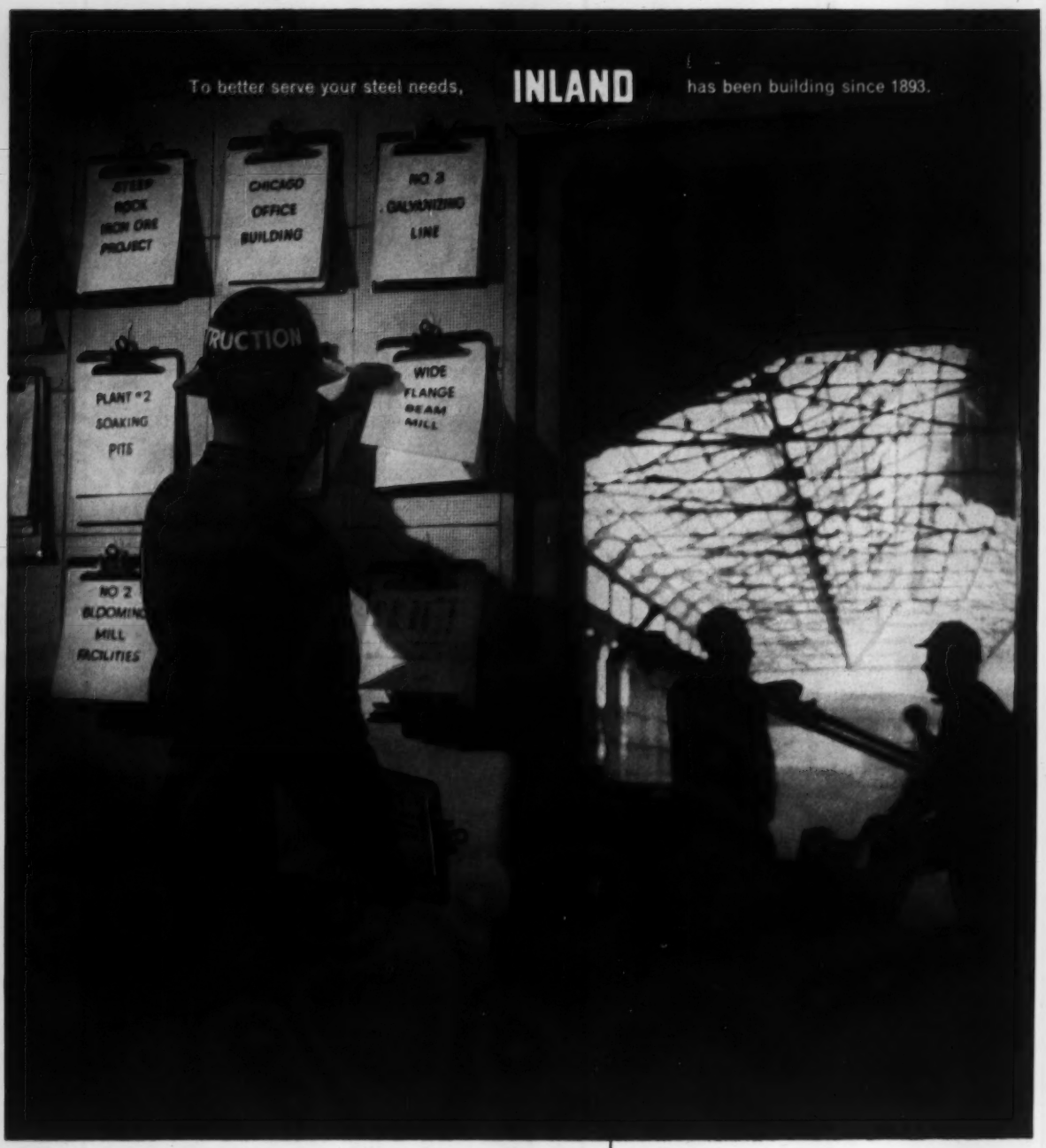
—Find out what you can supply. Requirements range from basic materials and fabricated parts to valves, pumps, instruments and machines.

—Determine whether you can use the atom in your own operation. Nine hundred companies are.

You will want to share in the civilian atomic industry. It's already here.

Who said there aren't any more frontiers to conquer?

Irwin H. Such
EDITOR


To better serve your steel needs, INLAND has been building since 1893.
STEEP ROCK IRON ORE PROJECT
CHICAGO OFFICE BUILDING
NO 3 GALVANIZING LINE
PLANT #2 SOAKING PITS
WIDE FLANGE BEAM MILL
NO 2 BLOOMING MILL FACILITIES

WHY INLAND WILL INVEST $35,000,000 IN YOUR FUTURE IN 1955

Banking on the ability of Midwestern industry to create new and improved products in ever greater volume, to satisfy the demand of the American people for a higher standard of living, Inland keeps pace with new and improved plants, processes and facilities to better serve their customers with quality steel . . . when, where and how they want it.

INLAND STEEL COMPANY
38 South Dearborn Street • Chicago 3, Illinois

Sales Offices: Chicago • Milwaukee • St. Paul Davenport • St. Louis • Kansas City • Indianapolis Detroit • New York

Principal Products: Sheets • Strip • Structural Shapes • Plates • Bars • Tin Mill Products • Rails and Track Accessories • Coal Chemicals

World Steel Capacity

(net tons of ingots and castings)

Free World Total		Soviet Bloc Total	
1955	1960*	1955	1960*
234,433,000	269,740,000	66,910,000	90,315,000
Percentage of World Totals			
77.8	74.9	22.2	25.1

*Estimated

Even if planned steel expansions work out . . .

West To Hold Big Edge on Reds

COMMUNIST countries may increase their share of world steelmaking capacity over the next five years.

By 1960, world capacity will be 360 million tons, reports the Business & Defense Services Administration of the Commerce department. If planned expansions are carried through, it estimates that the Free World will add 35.3 million tons to present capacity; the Soviet Bloc, 23.4 million tons.

Doubt — Observers feel that there's room for doubt about both the magnitude of the predicted Soviet expansion and the smallness of that predicted for the Free World.

American equipment experts point out that Russia has neither the facilities nor the equipment to carry through her program, which calls for the addition of 17.5 million tons in five years. That amounts to building three complete plants as big as Sparrows Point, they remark, adding that most of Russia's capacity today was either engineered by foreigners or stolen after the war.

Standard—Only once, during the hectic expansion since 1951, has the U. S. been able to achieve a similar expansion. Capacity has risen more than 20 million tons. Just ten years ago, when wartime emergencies were spurring construction, we boosted capacity only 12 million tons in a similar period.

Technologically, the Russian dependencies are in a worse way than Russia herself. Both China and Manchuria are just embarking on their first industrialization programs. They will be hard pressed to meet the goal set out by Chou En-Lai of 5.5 million tons by 1960, which means doubling capacity. Eastern Europe, whose goal is to up capacity from 15.4 million tons to 18.6 million, faces the same problems as Russia.

Joker—Uncertainty over financing is the biggest single factor holding down a larger expansion of Free World steelmaking, particularly outside the U. S.

Even in America, another round of major expansion may be limited by costs of building a modern steel plant. That's one reason behind BDSA's conservatism about the U. S. goal, which calls for the addition of 9.1 million tons. But merely to hold capacity in its present relationship with per capita consumption, we will have to add 11 million tons. And there's a well-established trend toward heavier per capita consumption.

Latin America—Financing problems are even more acute south of the border. Rather than satisfying demand, the new mills installed since the war have built the market. Colombia's American-designed plant, which started operations just last December, already is seeking financial assistance to expand capacity and broaden its product mix.

Brazil, financing permitting, will add more than 1 million tons, both by expanding the newly finished Volta Redonda plant and by building two subsidiary plants. Argentina will expand capacity from 235,000 to 1.1 million tons, using mostly American capital and equipment. Both Peru and Venezuela are planning their first significant plants.

One More — India is another first-rate example of financing problems. Although she has had bidders aplenty to contract for her five-year steel expansion program which was kicked off in 1951, production has gained only 100,000 tons to date. Her revised goal calls for the addition of 4.7 million tons by 1960. Unless foreign exchange problems can be solved, it's unlikely that it will be achieved.

Balance—Of the remaining Free World countries, Canada plans few expansions. Latest reports, however, have it that a 100,000-ton integrated plant will be built in British Columbia. Initially at least, bulk production will be pipe, aimed at the proposed $120 million transmountain natural gas pipeline from Peace river to the U. S. border. The mill will be built at an undisclosed upcoast site.

Western European countries plan to add 16.5 million tons in new capacity by 1960, bringing their total to 100.5 million. Despite the steel shortage, the Netherlands, fresh from an expansion program, will do no more building. Belgium and Luxembourg are concentrating on improving efficiency, mostly by scrapping marginal operations.

Race—Capacitywise, the United Kingdom and West Germany are running almost neck and neck. (West Germany, 21 million tons,

UK, 21.8 million). Both plan more. West Germany's proposed 3.1 million tons, however, will not be sufficient to hold her share of world totals. Steelmaking capacity of the United Kingdom must continue to accelerate if consumers are to have the 22.2 million tons of steel, which is the official estimate for 1958. She will be producing 27.5 million tons by 1960, to register an over-all improvement in her share of world totals.

The United States has more steelmaking capacity than the rest of the Free World put together. If the report's predictions carry through, however, the other non-communist nations will share 134.7 million tons among them by 1960, putting them almost on a parallel with the U. S.

Even if the Soviet Bloc can realize the whole of its estimated gain, it still will have barely one-third the capacity of the Free World. Many experts feel that a 10 to 15 per cent expansion would be more realistic than the predicted 35 per cent gain.

• *Extra copies of this article are available in quantities from one to three until supply is exhausted. Write Editorial Department, STEEL, Penton Bldg., Cleveland 13, O.*

Price Cutting: How Much, Where?

Sheet metal distributors urge caution in paring quotations. They point out that reports on competitors' price actions often are erroneous and should be checked

DO YOUR sales meetings turn into gripe sessions?

Louis F. Demmler, Demmler Bros. Co., Pittsburgh, has a solution. He says his company's salesmen must have the answer to any complaint they want to voice at biweekly sales meetings. Commenting at a meeting in Cleveland of the National Association of Sheet Metal Distributors, he said:

Self-Answer—If a salesman has to have a solution for the situation he wants to complain about, he may have found a way to overcome what was bothering him, or he may have found there wasn't any problem in the first place.

"By requiring a positive approach, we get away from the negative, and we prevent our sales meetings from turning into gripe sessions," Mr. Demmler reported.

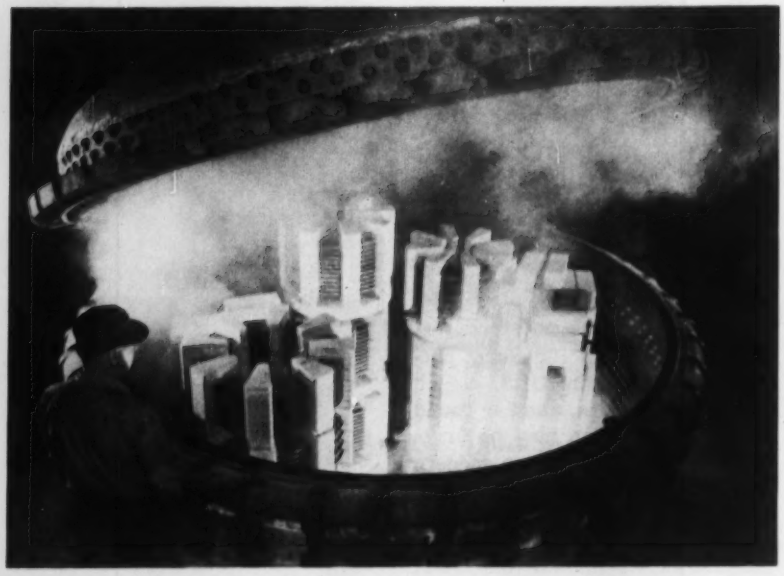
Are Prices Cut? — In similar vein, John Y. Petrie, Famous Furnace Co., Cleveland, told the sheet metal distributors that before cutting a price to meet a reported competitive situation, his company requires its salesmen to provide proof of price cutting. The salesman must fill out a report listing the name of the customer offered the lower price, the name of the seller offering the price and the price quoted. Then the salesman must tell whether he saw an invoice of sale at the lower price.

This gives Famous Furnace positive information for making decisions. It eliminates unfounded reports of price cutting.

Truck Cost Probe — Costs of trucking goods to customers are going to be scrutinized by the sheet metal distributors. They instructed their executive secretary, Thomas A. Fernley Jr., Philadelphia, to conduct a survey in their association to determine what deliveries cost.

"Maybe we won't be able to do anything about it, but, at least, it will be nice to know how much it is costing us to make deliveries," Lee J. Haines, president of the association, observed. Mr. Haines is with the E. E. Souther Iron Co., St. Louis.

T. W. Stevens of the Tiffin Art Metal Co., Tiffin, O., reported his company's cost of delivering by truck is 2.5 per cent of the dollar volume of sales delivered on those trucks.

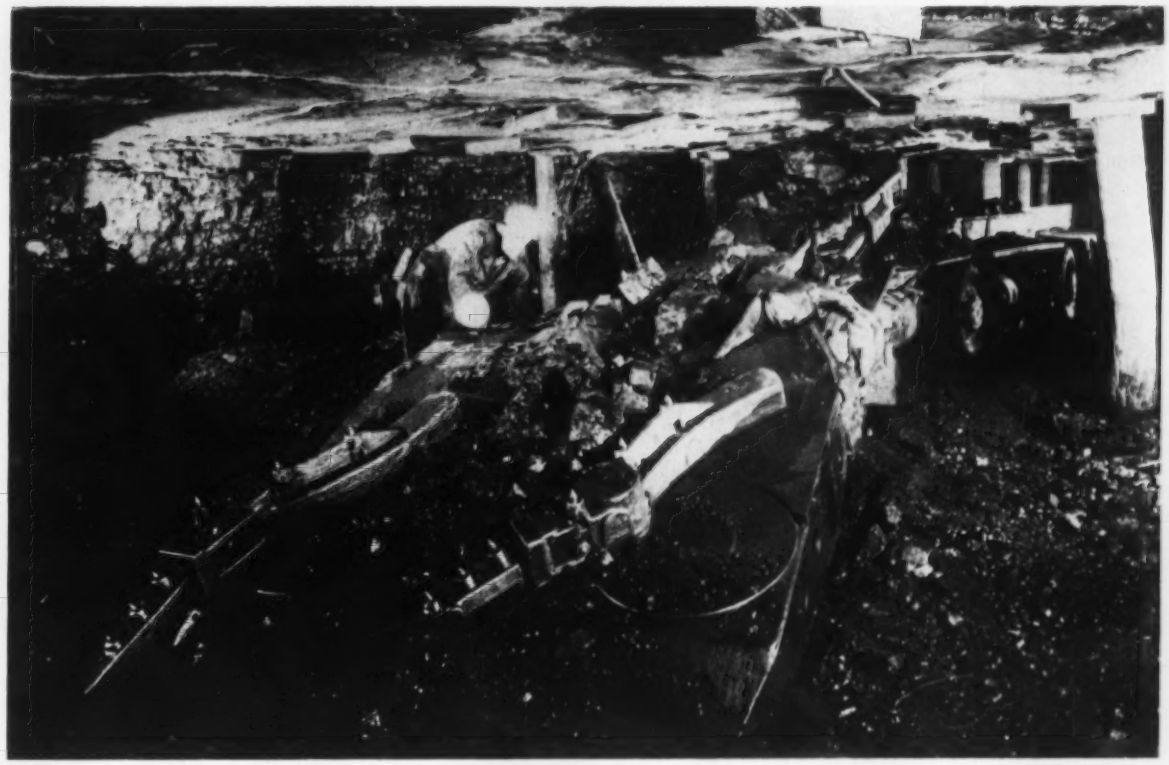


Steam-Filled Vat Cures Concrete Supports

It may look like a huge pressure cooker but it's the key equipment used in curing concrete supports in current-limiting reactors. Wet steam under high pressure and temperature impregnates the supports to speed curing and give extremely strong concrete. Automatic equipment controls a curing cycle of several days. Vat is used at General Electric Co.'s plant, Pittsfield, Mass.

Coast Ship Laws for Lakes?

Canadian shippers, with the St. Lawrence Seaway in mind, are whipping up interest in their bid to get American support for extending coastal shipping laws to the Great Lakes. Sights are set on foreign freighters, built at about one-half Amer-Canadian cost and manned by sailors paid one-half prevailing rates. There is no law to prevent this competition. Last year, a bill was drawn up for presentation to Congress, but it did not get acted on. It's certain that as the seaway comes nearer, action will be taken.



Joy Mfg. Co.

Coal show's accent on continuous mining points up . . .

Automation in Coal, Too

"IT'S NO longer if we should buy, but when we should buy continuous mining equipment," states a mine operator.

Most delegates attending the 1955 Coal Convention and Exposition of the American Mining Congress agree that economics are dictating mine mechanization.

Program—The four-day affair (May 16-19) in Cleveland attracted more than 10,000 mining officials and operating men who discussed and saw the latest developments in continuous mining, coal mine roof support, mechanical mining, trucking, power and coal stripping. Over $5 million worth of mining equipment and supplies were displayed by some 225 manufacturers.

Equipment sales for the first quarter are reflecting the thinking of the mine operator. P. M. Sheriger, field sales manager, Joy Mfg. Co., states: "We started this year with long faces, but by March we reached and then surpassed the 1954 sales rate for the same period. I feel we will do 25 per cent more business this year than we originally planned." Echoing his field sales manager's words, J. D. A. Morrow, company president, reports: "Our only problem is to get the orders out."

Optimistic, Too—Goodman Mfg. Co.'s C. M. Graham, convention manager, is confident that this year will be successful. First quarter sales were better than last year's and interest in continuous mining equipment is increasing rapidly.

While continuous coal mining is being accepted generally by the industry, it was brought out by William E. Hess, manager of coal mines, Vesta Shannopin Coal Division, Jones & Laughlin Steel Corp., that the biggest problem facing coal operators is the maintenance of continuous mining equipment. Mr. Hess states: "The policies governing maintenance require extensive study and careful planning by top personnel. Proper supervision of the machines by capable foremen also is necessary."

Future Requirements—K. L. Konnerth, mining consultant, feels that the development of a single continuous belt unit which will successfully go around corners and directly follow a continuous coal mining machine is a must in cutting operating costs.

Convention results: "Interest is much greater than we ever expected," states Joe K. Bole, assistant manager of sales, Bolt & Nut Division, Republic Steel Corp. "We had more traffic through our booth this year than we have ever had before."

U. S. Steel Aids Education

Grants totaling over $1 million will go to more than 400 colleges and universities in the U. S. Steel Foundation Inc. aid-to-education program for 1955. The new program provides $500,000 for capital grants, $480,000 for operating grants and $72,000 for graduate fellowships.

As vacations take their big bite, July will be . . .

Low Month for Metalworking

WHAT HAPPENS when 8 million metalworking employees pack their kids in the car and head for vacation land?

Answers Orrin B. Werntz, executive secretary, Screw Machine Products Association: "Most of our members plan to close down as usual. In the past, our unadjusted business index has dropped as much as 30 per cent in July." He feels that this year will be no exception.

Big Picture — The unadjusted Federal Reserve Board production index for metal fabricating shows that the vacation peak in July is a big factor in the summer business slump. In both 1954 and 1953, July was the low month. In 1954, the index fell from 153 in March to 138 in July. In 1953, it dropped 14 points from March to July.

This year, the pace of business may help soften the blow to the economy. Even though many producers of small steel castings are working five 9-hour days, some must refuse orders. Because business is so good, many more companies than usual are planning to stagger vacation scheduling, despite the administrative headaches involved. There's a similar situation in the stamping industry.

Cases—Pittsburgh Steel Co. is one of the many steel producers which won't close its plants this year. Its Thomas Strip Division, which in past years has closed down completely, has more than enough business to keep running full tilt through the summer. Republic Steel Corp. will ask some of its men to work through, offering them double pay.

Most metalworking plants are planning more normal schedules. A representative survey by Associated Industries of Cleveland of member companies shows that little change is contemplated in northeastern Ohio. Some 170 will close down for either one or two weeks, and more than 95 will stagger their programs. Last year, 181 closed, 110 staggered vacations.

Headache—However, the survey does highlight a problem that's of increasing importance to metalworking management. In 1950, only 20 companies gave 15-day vacations to employees with 15 years of service. This year, 140 will. Authorities believe that it won't be long before the 15-day vacation for 15 years of work will blanket metalworking. Increasing union pressure is one of the reasons.

One primary aluminum producer notes that in some of its older plants as many as 70 per cent of its workers get three weeks off. It has been forced to stagger vacation schedules. Industry generally will follow suit some day.

CIO Steelworkers Vs. Big Six

U. S. Steel leads off separate pay talks among the CIO United Steelworkers and the six top producing companies with which the union has contracts. The date is June 7. A day or two later talks begin with Bethlehem Steel Corp., Republic Steel Corp., Jones & Laughlin Steel Corp., Inland Steel Co. and Youngstown Sheet & Tube Co.

In the past the steelworkers concentrated attention on U. S. Steel, left negotiations with other producers on a stand-by basis until agreement was made with U. S. Steel.

Union president David J. McDonald wants a substantial pay hike. He says employment is 50,000 behind the 1953 average and 15,000 fewer production workers were employed in the first quarter this year than in the same period of last year, despite much heavier production.

$300 Million for Atoms

In the next four years, manufacturers, electric power companies, research institutions and other nongovernmental organizations will spend about $300 million on atomic energy research. The Atomic Industrial Forum Inc. also reports that large reactor power plants will become economically feasible some time after 1962.

In 1963, the manufacture of components for reactor plants may be a $700-million-a-year business.

Sales of Industrial Heating Equipment

	1955	1954
January	$4,973,088	$3,643,342
February	5,615,634	3,085,880
March	7,344,723	4,078,688
April	6,981,982	3,496,283
Total	$24,915,427	$14,304,193

Furnace Business Heats Up

SALES OF industrial heating equipment are on the upswing.

The climb started last December as a result of apprehension over the international situation, more favorable depreciation scheduled for capital equipment and a general lift in business.

Pattern—In the first 11 months of 1954, members of the Industrial Heating Equipment Association booked orders for $39.5 million worth of furnaces—30 per cent less than in the same 1953 period. But volume in December, 1954 ($6.8 million), doubled, compared with both the preceding month and December, 1953. Sales have been in high gear since. In first four months of this year, the industry racked up 74 per cent more business than in the like period of 1954 (see table). Except for the Korean era, volume is the highest since World War II.

There's a lot of competition for this increased business. Too often orders are taken without adequate regard for cost. For relief, many builders are turning to sharper examination of their cost accounting practices.

Better Equipment — Furnace builders can be expected to come up with further improvements in equipment. Walter Rex, president, J. W. Rex Co., Lansdale, Pa., told IHEA members meeting at Hot Springs last week that users want furnaces featuring simple design, easy maintenance and eye appeal. "External appearance has sold many a furnace," he said.

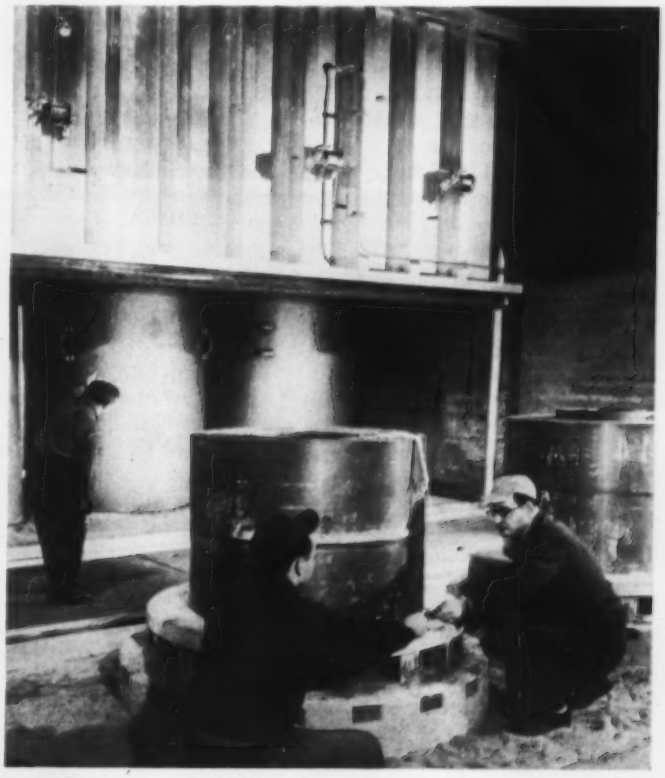
Other needs cited by Mr. Rex: 1. Multipurpose furnaces to handle new processes as they are developed. 2. Improved quenching oils. 3. Salts with greater temperature ranges that can be cleaned easily from heat treated parts. 4. Built-in CO_2 fire prevention equipment. 5. Improved furnaces for heat treating stainless steel, especially the 400 series. 6. Better methods for tempering bright-hard parts. 7. More accurate temperature control for induction equipment.

Trends cited by Mr. Rex: 1. Heat treating in atmosphere-controlled furnaces. 2. Brazing with higher temperature alloys, including copper and nickel. 3. Fabrication of jet engine blades by brazing with induction heat in a controlled atmosphere. 4. Use of atmosphere-type furnaces to eliminate scale on forgings. 5. Billet heating by induction at lower frequency ranges.

Conveyors: Optimism Flows

The Conveyor Equipment Manufacturers Association (CEMA) reports its index (1935 to 1938 = 100) shows the industry is making steady gains. For the first quarter, shipments were 608; bookings, 760. That compares with 750 and 672 for the same period a year ago. Shipments for 1954 reached 732, while bookings for the year were 644.

R. C. Sollenberger, executive vice president, CEMA, states: "Last year, we were cautiously optimistic. This year, we have dropped the word cautious and are just plain optimistic."



Workmen set silicon steel coils for annealing in one of 11 box-type furnaces at U. S. Steel Corp.'s Vandergrift, Pa., facilities

Steel Founders' Society of America

With an expected return to 1953 levels this year . . .

Steel Founders Bounce Back

BUSINESS IS BACK to 1953 levels for steel foundries.

Unfilled orders in January were over 200,000 tons for the first time in nine months. In February both shipments and unfilled orders rose.

One foundryman says: "Last year I could give rush delivery; this year I can meet only normal 30-to-60-day delivery."

Back to Normal—Working full blast in 1951, steel foundries produced over 2 million tons of castings; in 1952 they operated at about 80 per cent of capacity, dropped to about 70 per cent in 1953 and fell to 45 per cent in 1954. This year promises a return to 1953 levels—considered a good, normal year.

The highly volatile nature of the business in recent years is explained by the Korean emergency and the inventory reduction spree of 1954. Less than 5 per cent of the business in 1954 was for defense; in 1951 it climbed to 40 to 50 per cent of the total.

Capacity Up — Can the steel casting industry meet any future emergency? Steel founders think so. During a period of declining production (since 1951), they have raised their productive capacity over 15 per cent. One industry official states: "Ability to make large steel castings is greater than the ability to process them. Better planning of requirements, not more foundry capacity, is needed for emergencies." Large castings also can be made of cast-weld construction.

Steel founders report new business is resulting from the Steel Founders' Society product development program. Estimates state the new business is equal to the production of ten average-sized shops.

Changes—A slight trend: Some casting users are acquiring their own foundries. At the same time, jobbing shops are copying the techniques used in high production shops. Modernization, push-button molding, better layout, palletizing and sand recovery are among the techniques studied and adopted by the job shops.

The next step of the steel foundryman is likely to be the adaption of shell molding to low carbon steel castings. Early reports on research initiated by Steel Founders' Society are encouraging. The process will bring steel castings to the market which have better finishes and increased dimensional accuracy.

Tax Write-off for U.S. Steel

The Office of Defense Mobilization issued a certificate of necessity for accelerated tax amortization on 40 per cent of the $8.5-million electrolytic tin plate facilities of U. S. Steel Corp., Gary, Ind.

Total value of certificates issued for 63 facilities in the Apr. 21-May 4 period was $94,270,717.

Other certificates went to Jones & Laughlin Steel Corp., Pittsburgh, for $1,057,500 worth of steel plant facilities; and to the Pennsylvania Railroad for $1,049,950 of ore unloading facilities.

Small Firms Step Up Research

Some 400 commercial laboratories help them do it. Their metalworking business rises as the pace of technological development quickens

FOR LESS THAN $50 a small manufacturing firm had laboratory science solve a production headache.

Scrap loss on a tool steel part was high because of breakage. An independent laboratory examined the part and recommended: Use a carburizing steel which costs less and is easier to fabricate. Comparing performance of the new and old part, field reports show: The two are equal as far as wear is concerned; the new part has superior shock resistance.

This is just one of the services offered by some 400, tax-paying, commercial laboratories in this country. The American Council of Independent Laboratories Inc. (ACIL) reports that out of its 65 members, 32 are prepared to analyze and test steel, iron and nonferrous metals. Some 28 are equipped to work with metallic coatings, and 26 are qualified to inspect structural steel.

Advantages — ACIL points out that the independent offers: 1. Diversity of experience, contacts and information on specific materials, processes, etc. 2. Efficient investigation and quick results on specific problems. 3. Independent viewpoint.

How can metalworking companies use commercial laboratories? California Testing Laboratories Inc., Los Angeles, reveals that 40 to 50 per cent of its efforts are involved in ferrous and nonferrous metals. This includes: Acceptance testing and analysis of sheet, plate, structural shapes, castings, forgings, welded parts; proof-loading of flash welds; and hydrostatic and pneumatic testing of finished products. Another 20 per cent of its business is in metal processing and testing and the inspection of building materials and finished construction.

"Little Plant?"—The small-to-medium-sized manufacturer can take advantage of the technical know-how of the commercial laboratory. Claude E. McLean, president, Arizona Research Laboratories states: "We offer the small company a staff service which can be terminated at will. This is a great value. The small concern does not have to worry about carrying salaried men or expensive equipment after the job is finished. We carry them."

Prices—Due to the nonstandardization of investigations, both in techniques and duration, it is best to contact a laboratory which is equipped to meet your particular problem. One of the underlying principles of the independent laboratory group is co-operation. While each firm is not equipped to do all types of jobs, there usually is one which is qualified to meet the conditions of any given problem.

When contacted, the laboratory will be prepared to supply either a bid, an estimate or a maximum cost figure. A bid for any project is generally compiled by considering the base rates for lab man-hours and the estimated time the work will take. If a part submitted for testing fails before all of the tests have been completed, a company is billed only for "work finished."

Lewis F. Herron, president, James H. Herron Co., Cleveland, and ACIL's president states: "The number and complexity of new products, together with customer insistence on quality, is resulting in a noticeable expansion of our members in the metalworking field."

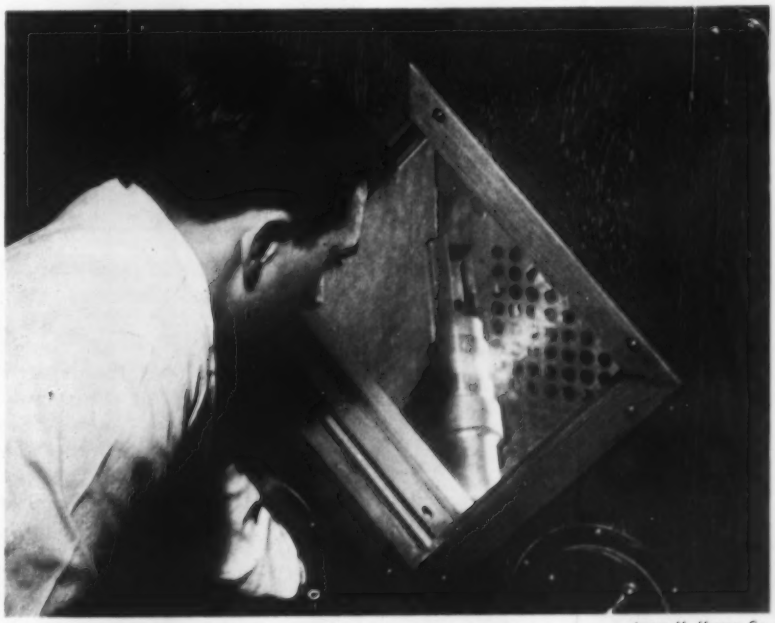
Weapon System Concept Works

The weapons system concept is paying off for the Convair division of General Dynamics Corp.

Under it, the aircraft manufacturer has the responsibility to find, develop, buy and install all items of equipment (except engines) previously furnished by the government.

August C. Esenwein, vice president of Convair, says the system yields ". . . amazing results in technological advances, foreshortened time cycles, lowered costs and an integrated and effective end product."

But Convair is not encroaching on the electronics industry, says Mr. Esenwein.



James H. Herron Co.

A landing gear component being tested at −65° F

Improved Highways Coming Soon

IT'S STILL in the "hassling stage," but the U. S. is going to get about 40,000 miles of improved interstate highways.

By a vote of 8 to 5, the Senate Public Works Committee approved and sent to the Senate floor the Gore Plan which calls for a spending program of $18 billion. States will contribute $5.4 billion; the federal share will be $12.6 billion. Committee Republicans (the five dissenting voters) have announced that they will wage an all-out fight for the President's $101-billion program. The Gore plan, they say, is "completely inadequate."

Meanwhile—The House Bill (H.R. 4260) calls for a $25-billion program over the next ten years. To finance this, the bill provides for the creation of a Federal Highway Corp. which will be authorized to borrow up to $21 billion. Some $622.5 million will be paid annually to the corporation from federal gasoline and special fuels taxes to pay back the loans.

Sampling Opinions — Robert Moses, New York's co-ordinator of public works, states that the Eisenhower plan will do the job—the Gore proposal will not. Senator Albert Gore (Dem., Tenn.) replies: "Mr. Eisenhower's plan will be defeated on the floor of the Senate when it is offered as a substitute for my bill." When the smoke of battle clears, look for the government to shoulder at least 90 per cent of any program and for a new highway corporation to be formed.

ODM: New Planning Group

■ George A. Landry, Office of Defense Mobilization's director for production, is chairman of a newly created Mobilization Production Committee.

Its responsibilities: 1. Review and advise on ODM production plans for the future. 2. Serve as a means for implementing and preparing plans for national emergency. 3. Perform the central programming function to meet mobilization needs. 4. Study atomic energy requirements and related steel, copper and aluminum mill set-asides under the Defense Materials System.

Key personnel from the departments of Agriculture, Commerce, Defense, Interior and Labor, the Atomic Energy Commission, Federal Civil Defense Administration and Interstate Commerce Commission will be committee members.

FOA Sings Swan Song

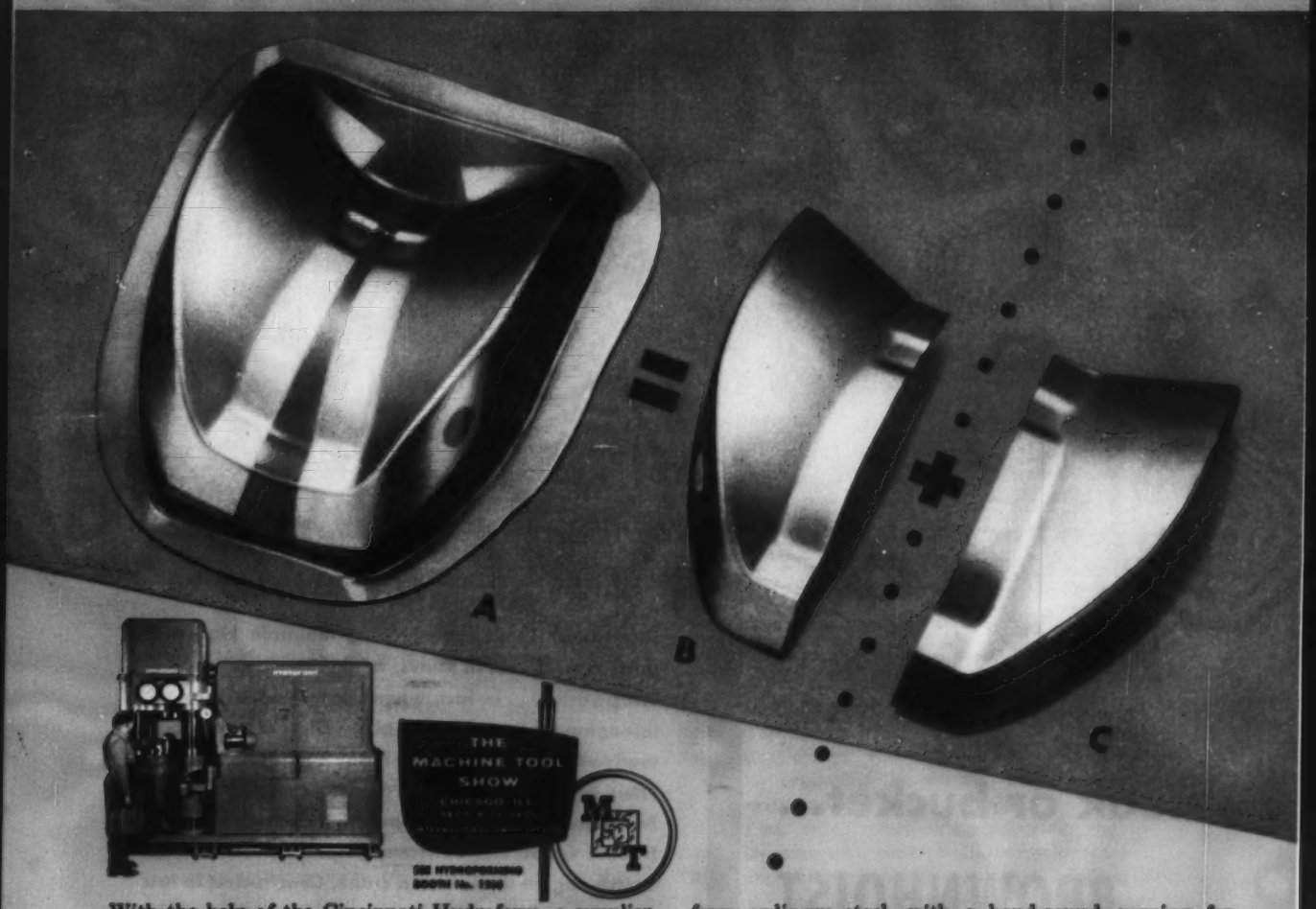
■ Effective June 30, the Foreign Operations Administration (FOA) is abolished. Its affairs will be transferred to the Department of State and Department of Defense. This action is in accord with the Mutual Security Act of 1954, which provides for the termination of FOA not later than June 30, 1955.

AF: New Analysis

■ The Air Force is determining policies for an equipment analysis program. Under direction of Paul H. Butler, Industrial Resources Division, AF, the proposed report will contrast active with reserve equipment. If the program is approved, the analysis will be conducted by the Air Materiel Command.

Meet William M. Firshing: Director of the Power Equipment Division of the Business & Defense Services Administration, he is on loan from Babcock & Wilcox Co. where he is executive assistant to the vice president in charge of the Boiler Division. Mr. Firshing joined B & W in 1919, serving in the Marine Engineering Department. He headed the department from 1929 to 1941 when he became assistant to the manager of the Marine Department. In 1948 he assumed his present position. He has served as a consultant to BDSA since July, 1954. He can be reached in Washington at Sterling 3-9200, Ext. 4241.

Tricky automotive part gets the Hydroform treatment



With the help of the Cincinnati Hydroform, a supplier to the automobile industry has greatly simplified his production of complex-curved, right-hand and left-hand body structural components.

In the example illustrated above, shape "A" was accurately developed, then readily drawn on a 12″ Hydroform from a 10¾″ dia. blank of 20 gage cold rolled steel. (Note the extreme variations in contours.) Parts "B" and "C" were produced simply by sawing the parts out of the drawn shape. Shape "A" has been masked and paint sprayed, forming guide lines for sawing.

Tool costs were exceptionally low. The Hydroform punch was cast to shape in Kirksite. The draw ring was made from ordinary steel, with a band-sawed opening for the punch.

A similar Hydroforming procedure to that described above is being used successfully, with very substantial time and tool-cost savings, for the forming of duct sections for jet engines from heat-resisting materials.

Have you fully investigated the many Hydroforming advantages . . . and if Hydroforming can be profitably applied to your work? Let a Cincinnati Milling field engineer give you complete information. For a description of the Hydroforming process and specifications of the 8″, 12″, 19″, 23″, 26″ and 32″ machine sizes, write for Bulletin M-1759-3.

Hydroform

PROCESS MACHINERY DIVISION

THE CINCINNATI MILLING MACHINE CO.

CINCINNATI 9, OHIO, U. S. A.

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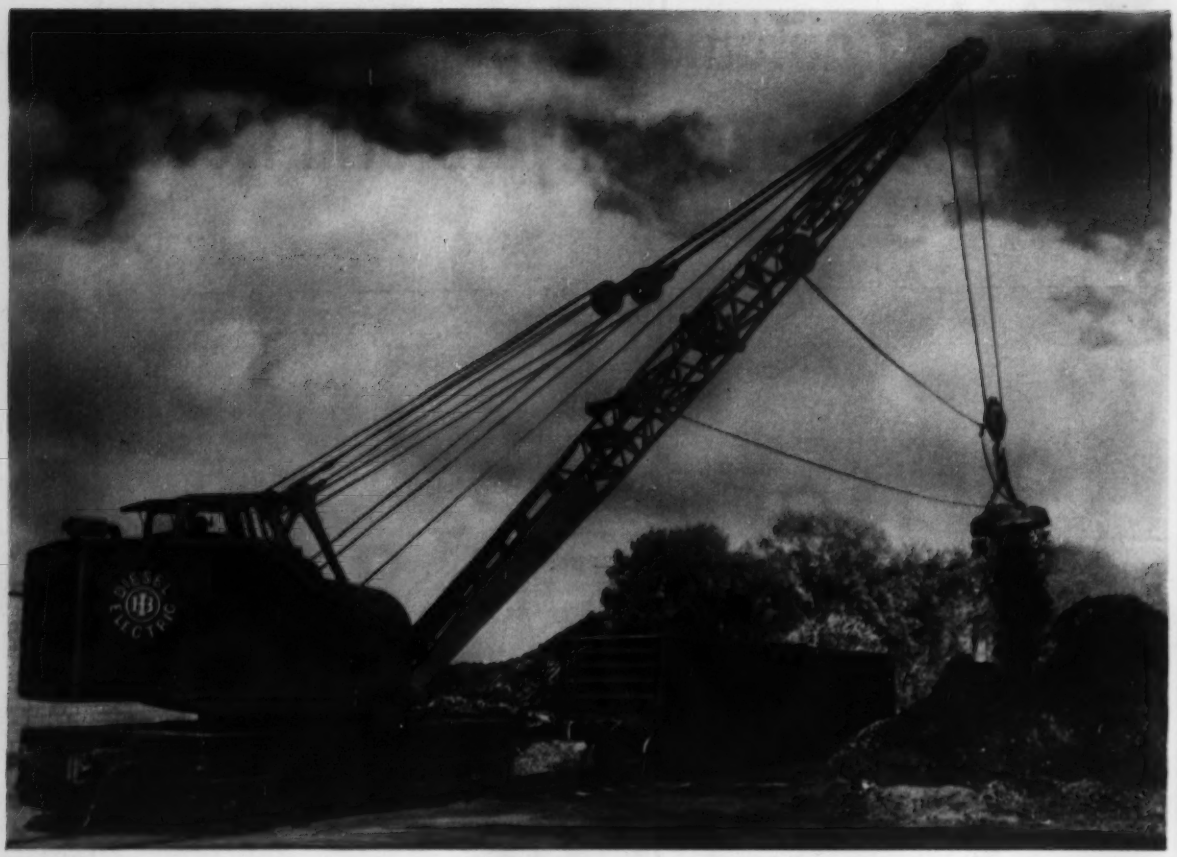

With magnet hook or bucket... BROWNHOIST speeds the job

Brownhoist Cranes are helping maintain high production schedules in mines, steel mills, factories, and scrap yards . . . in fact, wherever there are railroads throughout the world. Brownhoist Diesel-Electric Locomotive-Cranes, for all their husky size, handle easily. Their patented Monitor Type Cab and Clear-Vision Boom give a 360° view. Operating controls are within easy reach. Electric travel permits operation as a switch engine as well as a crane. Constructed to last for many years with little maintenance. Brownhoist Diesel-Electric Cranes are available in capacities from 25 to 100 tons. For complete information, consult your nearest Brownhoist representative or write us today.

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BROWNHOIST

BROWNHOIST MATERIALS HANDLING EQUIPMENT GIVES A LIFT TO AMERICAN INDUSTRY

SUBSIDIARY OF Penn-Texas

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George T. (Captain) Griffiths: Riverman

ONE DAY last October, the Monongahela river rose 20 ft in 18 hours at Clairton, Pa., but George T. (Captain) Griffiths, division superintendent of U. S. Steel Corp.'s river transportation, didn't lose one of the 152 barges moored at the plant. That was no normal day for Captain Griffiths, but every 24-hour period has its problems, especially when one plant needs 30,000 tons of barged coal a day. "Our job is to carry it from mine to mill (at Clairton) in barges holding about 900 tons of cargo each," he says.

Mines Report—Work begins with reports from each of the corporation's 14 Monongahela valley mines. "They tell us how many barges they have, how many they'll need that day," he explains. "Our largest mine may need 26 barges one day, 22 the next. The average for all mines is 43 bargeloads of coal a day."

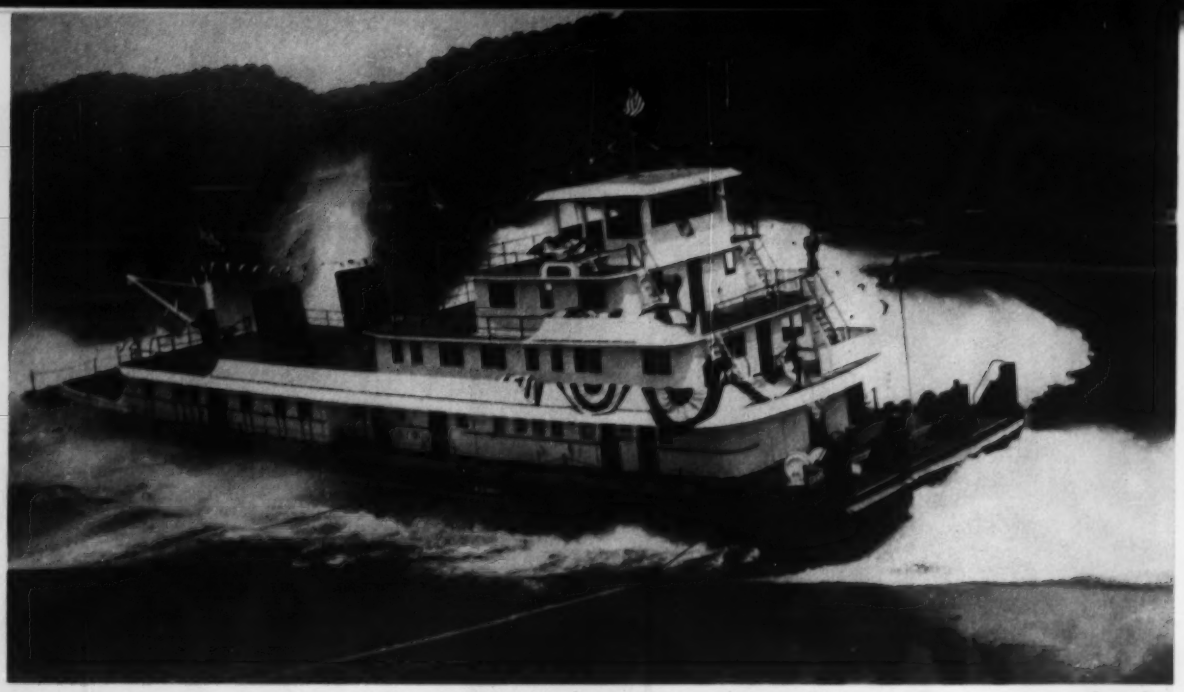
Captain Griffiths commands a fleet of seven towboats, 325 barges, four small tugs and several maintenance vessels. He also manages the Clairton Marine Ways, where the vessels are kept in repair. "This division already carries 1 million tons of steam and coking coal a month in our district, and we'll need more barges in the future," he predicts. His division also carries sulphuric acid and steel rods between plants, but coal is 99 per cent of total shipments.

Old Hand—Always a riverman, Captain Griffiths grew up in sight of the "Mon," working at Clairton and on nearby river docks. After some years as a towboat captain, he took over the helm at U. S. Steel in 1937. He has seen the modernization of towboats, with new diesels gradually replacing the old stern-wheelers. Six of his boats are now radar-equipped.

From an office overlooking the river, he directs five men who control the barge operation. They pinpoint each barge's location, sending it where it's needed. "Clairton is working near capacity, but our division must anticipate any ups and downs in planning the number of barges needed," he comments. "Further complications come up because mines work five days a week; the coke plant works seven."

Tough Assignment—River skippers point out that a towboat with a normal complement of barges is as long as a large ocean liner. When a new lock opened in the Monongahela recently, Captain Griffiths was at the wheel of the first towboat to pass through it. With 700 ft of barges ahead of him and a clearance of 1 ft on either side, he negotiated the lock without a scrape.

When not discussing Pittsburgh's struggling athletic teams, Captain Griffiths' favorite hobby is the river itself. On the wall of his office are photographs of barges. In his bookcase, books about barges.



Dravo Corp.

River Boats: Making a Bigger Splash than Ever

OL' MAN RIVER has a new look. In place of the gilded, smoke-belching paddle wheel steamers of Mark Twain's day are fleets of sleek towboats moving more tons of more products than last century's river pilots ever dreamed of.

Traffic on the Ohio alone last year was about 65 million tons, compared with a piddling 2.5 million tons in 1870. Freight traffic on rivers and canals reached a record 75 billion ton-miles in 1953. American Waterways Operators Inc., Washington, estimates 1954 was 7 per cent above that. And the rise still hasn't crested; 1955 traffic should just about double a year as recent as 1948 (see table).

Potpourri—Growing, too, is the variety of materials transported. During a typical year on the Ohio river, the Army Corps of Engineers reports traffic consisted of 31.7 million tons of coal and coke, 13.5 million tons of oil and gasoline, 8.5 million tons of stone, sand and gravel and 3.4 million tons of iron and steel.

Among other materials carried were 1.6 million tons of chemicals; 561,000 tons of vegetables, food products and beverages; 369,000 tons of machinery and vehicles; and 298,000 tons of sulphur.

Economics—Steel shipments by river began to increase with the end of the wartime steel shortage. Producers could take a few more days to ship certain items and benefit from lower freight costs and dependable shipments by barge. Products shipped include ingots, blooms and billets, pipe and fittings, tin plate, pig iron and iron ore.

"To the shipper of steel, good barge transportation offers advantages of shipment in big lots at economical rates and benefits of expanded markets," comments L. L. French, president, Union Barge Line, Pittsburgh.

Savings — To the seller, inexpensive river transportation brings an expanding market area for his firm. He can send his product farther, reach untapped areas without investment in a new plant. National Supply Co., Pittsburgh, says most of its barge shipments are destined for Louisiana, Texas, Mississippi and Tennessee. Some are for export, via inland waterways.

Cost savings influence many decisions to ship by river. One producer says shipment by barge from Pittsburgh to New Orleans for export to Europe costs less than rail shipment to New York for export. Barge shipment of steel pipe from Pittsburgh to Houston, plus the unloading charge, costs about half as much as rail shipment.

Hello, Dixie—The low cost of river shipment is particularly attractive to the steelmaker in Pittsburgh or Chicago competing with firms in the South or Southwest. A major tubemaker in the Ohio valley ships 70 per cent of its tube and 10 per cent of its sheet to points on the Ohio, Mississippi, Missouri or Tennessee rivers by barge. Without river transportation, this firm couldn't sell successfully in those areas from a northern plant. "With river transportation, we're a southern company," a sales manager adds.

Reports a Pittsburgh sheet producer: "Low-cost barge shipment along the Ohio and Tennessee rivers to Chattanooga, Tenn., enables us to meet competition from Birmingham plants. We ship to Louisville and develop new markets there, thanks to barge transportation. We supply customers at Kansas City and Memphis by river from Pittsburgh mills."

Terminals — In 1954, northern

producers of tube products for oil country use were faced with demand for quick service—quicker than the 16 days required for Pittsburgh to Houston shipment. Now Pittsburgh steelmakers store their products at terminals at such points as Houston, Memphis, Tenn., Kansas City, and Corpus Christi, Tex. Customers receive quick service from those terminals; shippers retain the values of barge shipment.

To top management, advantages of barge transportation are an added incentive to locate new plants along rivers. Since World War II, new investment in industrial plants and expanded facilities amounting to more than $10 billion have been made or projected along the Ohio and its tributaries, reports the Ohio Valley Improvement Association Inc., Cincinnati. This creates greater need for riverfront facilities. "Between 1948 and 1954 Dravo Corp. built 85 docks along the Ohio," comments Carl B. Jansen, president.

A Parade — Each new plant means more work for barges. River craft will deliver thousands of tons of cement, structural steel, crushed stone and other building materials to plant construction sites this year. After the plants are built, barges will haul away finished products.

It's estimated that in the last two years over three-quarters of all steel plant expansion has been along inland waterways. Paper, petroleum, chemical and electric power industries also are drawn by attractions of river transportation.

Organized—Together with greater use of river highways is a trend to improved, more dependable barge transportation. Once irregular, bargeline service now is well organized and closely scheduled.

Barge and towboat builders respond to increasing demands of industry by improving the performance of their craft. Diesel towboats built today can manipulate up to 20 steel barges with 20,000 tons of cargo. Radar guides the towboats through fog.

Custom Models — "Special-purpose barges are designed for use in shallow rivers. We've improved formations of barges to utilize full push-power of towboats. We've designed barges specifically to carry corrosive chemicals, such as sulphuric acid," adds W. E. Clark, Dravo vice president.

Together with improved barge service, there's a trend to bigger and better terminal facilities for loading and unloading vessels. Transshipment between barges, railroads and trucks is on the increase.

Fleet Grows—While demand for barges exceeds supply at some river points, the total inland waterway fleet in 1954 was the largest on record. The commercial fleet increased by 17 per cent in the last eight years. It's estimated that 1954 launchings at inland waterway shipyards numbered 97 towing vessels; 2290 smaller diesel-powered vessels in small towboat, workboat and fishing classes; and 800 barges and scows.

With wage and raw materials costs rising, prospects are that barge traffic will continue to increase. But there's much to be done before rivers can handle traffic anticipated in years to come.

Work Needed — "Most of the Ohio river locks and dams are outmoded, deteriorating and nearing the end of their useful life," reports Ohio Valley Improvement Association. "There's a definite need for modernization of locks," agrees Mr. Jansen. "Two dams along the Ohio must be replaced, and the channel may be increased from 9 to 12 ft."

An Overhaul—The need for an overhaul exists throughout the Mississippi valley system which carries over half of all inland waterway traffic. Reports the Mississippi Valley Association: "Something must be done about unfinished locks, silted channels and neglected dams along the Ohio, Warrior and Tombigbee rivers. Industry follows improved waterways," the association points out. Ol' man river's still a pretty important gent.

Inland Waterway Traffic

(exclusive of Great Lakes)

(in million ton-miles)

1955	86,000*
1954	80,000*
1953	75,056
1952	63,837
1951	62,000
1950	51,657
1945	29,709
1940	22,412
1935	13,406
1931	9,233

Sources: American Waterways Operators Inc.; Corps of Engineers. *Estimated.

U. S. Army

To our Favorite Boss!

From the receptionist at the front door through to the last man on the loading platform—*all* of us here at Great Lakes Steel have a very important *something* in common. It is the knowledge that your continued and expanded need for our products determines the future and growth of every one of us, regardless of our individual jobs here.

It is the knowledge that *you*, Mr. Customer, are the boss!

That's why we at Great Lakes are seeing to it that our steel is the kind you have a right to expect from a specialist in flat-rolled products. We know the importance of prompt shipments, top quality, proper packaging and loading, dependable information, and clerical accuracy. We think you'll agree that our many satisfied customers are a pretty good indication that this policy is good business for all concerned.

Next time you have a problem in steel, call on one of our representatives to help you solve it. You'll be glad you did!

GREAT LAKES STEEL CORPORATION
Ecorse, Detroit 29, Mich. • A Unit of
NATIONAL STEEL CORPORATION

NAX HIGH TENSILE STEEL

SALES OFFICES IN BOSTON, CHICAGO, CINCINNATI, CLEVELAND, HOUSTON, INDIANAPOLIS, LANSING, LOS ANGELES, NEW YORK, PHILADELPHIA, PITTSBURGH, ROCHESTER, ST. LOUIS, SAN FRANCISCO AND TORONTO

Mass-Produced Dies Cut Costs

A Lansing, Mich., maker has adapted assembly-line techniques to a traditionally custom operation. It developed its own fixtures and equipment to turn the trick

MASS PRODUCTION and diemaking are getting together at Custom Die Co. in Lansing, Mich., and the savings of up to 25 per cent and more to industrial die users are delighting automakers like the news of a new color spectrum.

It all started a few years ago when Custom Die got an order for turbine blade forging dies. Used to form titanium and hard alloys, these shape squashers lasted about as long as a lead chisel in a tombstone factory. For that reason, Custom Die claims no clairvoyance in recognizing the need for mass production of the dies, but it did apply an unusual approach.

New Look—To meet the required volume of several hundred sets a month, the company approached the dies as a volume product rather than as a series of custom units. Engineers analyzed the steps required to make the die halves and developed fixtures and equipment with production in mind.

Die blanks were cut from forged bars rather than forged individually. They were placed in fixtures for grinding to rough size. The blanks then were placed in fixtures on profiling equipment, with duplicator attachments for kellering. Tops and bottoms were gathered in lots and run through separately by operators who performed only this one operation on the part.

Incongruous — Next the lots moved through a benching machine developed by Custom Die for the job. It incorporates a tracing head and a small belt grinder. The surface pattern master die is duplicated on the grinder. Following this operation, the dies were ready for finish-benching, an area in which mass production meets its maximum incongruity.

To overcome the incongruity, Custom Die set up a school to train men to finish the surface of a specific portion of either the top or bottom die. This took only about two months since it covered just one production step.

Cost Cutting—The net result was that Custom Die not only achieved its production but was able to produce in quantity at a price about one-tenth the cost of the original set.

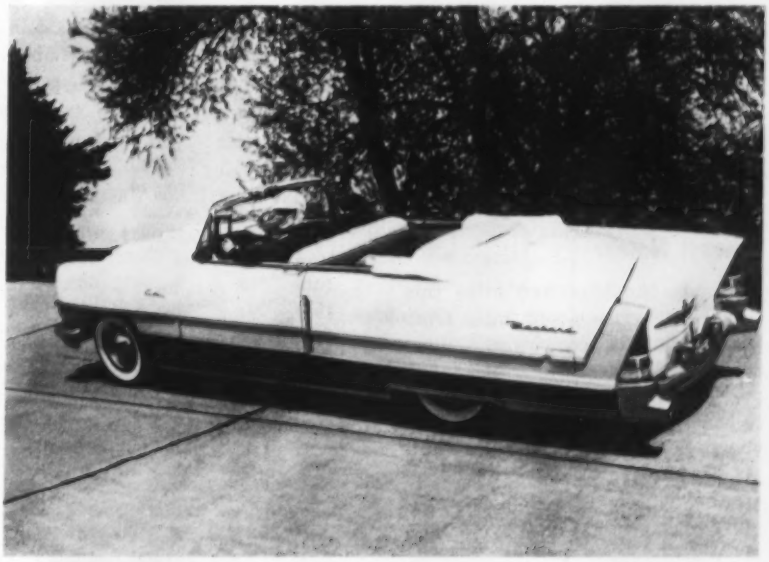
Savings like that, of course, are the exception because of volume. But Custom figured the principle of applying methods used in other industries to job shop operations also would work for customers with smaller volume requirements.

Case in Point — One customer buys a forging insert die for a steering gear sector. Ordering the dies a set at a time, the cost came to about $350. But Custom Die persuaded the firm to order a three month supply which amounted to 75 sets. As a result, the dies now are being delivered for $240 per set.

A forge shop producing axle shafts found it could cut its costs 30 per cent by ordering 20 sets, a three month supply. For the last 12 years, another customer had been ordering 24 dies a year. He was surprised to learn that he could save about $200 per set if he ordered a six month supply.

Cost Controls — Savings passed on to the customer are made possible by savings in production costs at Custom Die. A big factor is the ability to plan production. In preparing its bids, the time in each machine is calculated as well as the tools required. The equipment schedule can be planned as well as the bench schedule, heat treat, etc.

That means no time lost in sending out for tools or wating for a machine that is tied up. When the workers get a job at Custom Die Co., it already has been planned



Packard Caribbean Aims at Luxury Market

A high-torque, 275 hp V-8 engine powers Packard's custom-built sports convertible to be produced in a "limited edition" of less than 1000. Shipments will be sent to 400 dealers in key cities to get the broadest possible market distribution. The cars are built as a style-pilot series for future design

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for them; tools and equipment will be available when needed. Further, a breakdown on the costs by steps and the time required for each enables the foreman to put his finger directly on the operation that is putting him behind if trouble develops in meeting the schedule.

The Load Shifts—William Lanzing, secretary-treasurer and administrative executive, explains: "Planning has to be done to quote intelligently anyway. We merely take the planning off the shoulders of the man in the shop on our production diework. Then we have a fulltime quality control department which inspects the work to be sure that he did the job correctly."

Even though special tooling must be amortized, Mr. Lanzing reports that economies brought about through its use still can make possible savings of 10 to 15 per cent on quantities of only four or five sets of dies. Also a factor in the savings, he feels, is the fact that a worker can repeat a job more quickly than he can do it once.

Traditional — Maximum savings, of course, come in quantities of 20 sets or more—20 to 25 per cent savings are not uncommon. "But a major problem," says Mr. Lanzing, "is getting forging, forming, extruding, stamping and diecasting shops which traditionally purchase one or two sets at a time to realize that they can save by buying in volume."

That may be true today, but where there's a saving to be made it won't take the word long to get around.

Exhaust Notes

Among the hues and cries this week were cries about hues from Oldsmobile. In case you were wondering if frantic fuchsia had taken over, you'll be only mildly relieved to learn that greens and blues split about 40 per cent of the Olds output fifty-fifty. Chartreuse is last on the list, and black is twice as popular in New England as it is in the rest of the nation.

Chrysler's share of the total U.S. auto market is 40 per cent greater than in 1954. It's at 18.5 per cent for the first four and a half months of 1955. Now building more than 30,000 cars a week, the company's output is twice the rate at this time last year.

A European technique of model designation by "Mark I," etc., is being used by Lincoln on its new Continental line. The reasoning is that the car is not to be identified with a year but with a type.

The new Continental will be known as the "Mark II." The European technique of labeling the car with its type rather than the year it was produced is to emphasize the basic body design of the car rather than give it a deterioration label, which is all classy stuff indeed. The Continental will appear in early fall.

Among things blossoming with the dandelions are the Chrysler blue heron and green falcon, which are fetching paint-and-trim specials in the Windsor line. Also announced not too long after advertising already had appeared is the Packard Caribbean, which will be limited to five to any one city. This sport convertible will retail for $5932, and the limited edition will encompass only about 1000 units.

The new sealed beam headlamp, utilizing a filament can overcap over the low beam and increased candle power, will become factory installed original equipment after July 4. The new headlamps are marketed under such names as "All Weather." In six months of driving, they demonstrated superiority under all driving conditions. All drivers are advised to consider them. They're good.

Buick registered 171,537 cars during the first three months of 1955 to continue its third place lead. Meanwhile, its chief competitor, Plymouth, reports it has shipped more cars to dealers so far this year than during the entire 1954 model year. Every month this year it has broken monthly records.

Ford Motor Co. recently broke ground for the new Chassis Parts Division Plant north of Detroit. Planned for operation in June, 1956, the 1.4-million-sq-ft plant will employ 7000 persons. It will produce differential and axle assemblies, ball joint suspension assemblies, driveshafts and related parts.

Also under way is a multimillion dollar program to increase Plymouth body production at the Mack Avenue Plant of Chryler Corp. in Detroit. Under the first phase of the program, production capacity has increased 13 per cent. The enlargement of stamping capacity will increase that capacity still further.

Auto, Truck Output

U. S. and Canada

	1955	1954
January	780,780	594,467
February	770,530	574,215
March	955,027	672,858
April	936,994†	676,269
May		621,262
June		623,732
July		543,540
August		523,799
September		364,441
October		312,078
November		616,395
December		761,954
Total		6,885,010

Week Ended	1955	1954
Apr. 16	218,078	148,559
Apr. 23	225,074	157,710
Apr. 30	231,021	159,206
May 7	215,756	154,640
May 14	222,847†	153,796
May 21	217,000*	157,993

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

White To Make Diesel Engines

White Motor Co., Cleveland, a leading manufacturer of motor trucks, has become a major producer of diesel engines, through acquisition of National Supply Co.'s Diesel Engine Division, Springfield, O. William F. Burrows has been appointed general manager of the division.

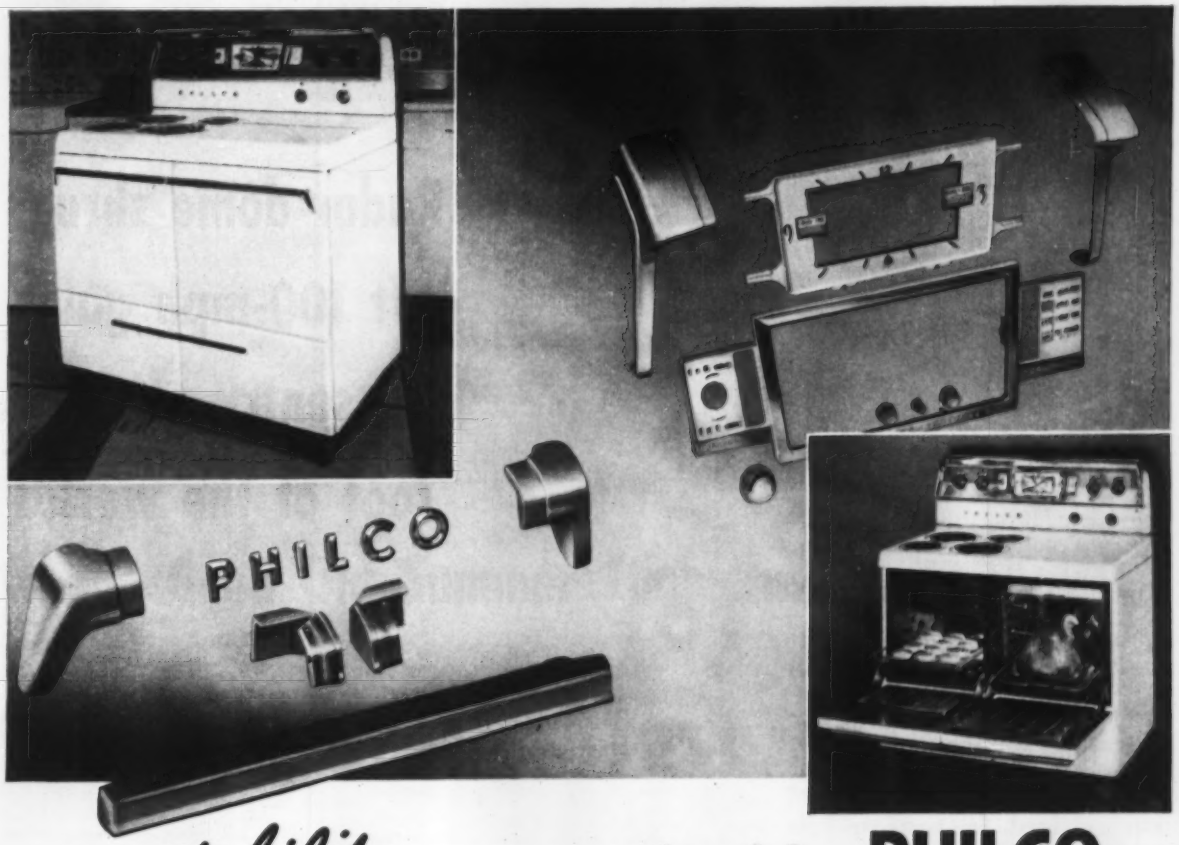
Aircraft Shipments Up

March shipments of civilian planes totaled 478. They were valued at $27.8 million. March, 1954, shipments were 312 planes, valued at $23.3 million. Shipments of aircraft were 1,032,100 lb in March —up 7 per cent from February.

Engine shipments in March consisted of 680 engines, valued at $6.3 million.

The value placed on export shipments in February (aircraft, parts and accessories) was over $39 million.

WHY ZINC RATES FIRST IN DIE CASTING • NUMBER 3 OF A SERIES



castability — as utilized by PHILCO

These components of the 1955 Philco Roastmeter electric range reveal the wide design latitude possible with ZINC die castings. No other metal or method of production offers product engineers equal freedom of expression with respect to shape, detail and finish.

Consider, for example, two of the castings—the clock face and frame. Not only are these ZINC die castings extremely complex in shape, but the lettering and numerals (both recessed and raised) are sharply defined and the casting surfaces are ready for either plated or painted coatings.

While these attributes of ZINC die castings govern the appearance of the finished product, they also have a decided influence on production costs. The complexity of shape and clean-cut design details minimize the need for secondary operations. And the smooth as-cast surfaces of these ZINC die castings easily take and hold any commercial finish.

Other examples of product engineering with ZINC die castings will be covered in future advertisements in this magazine. Send for our brochure and contact any commercial die caster for the answers to your particular production problems.

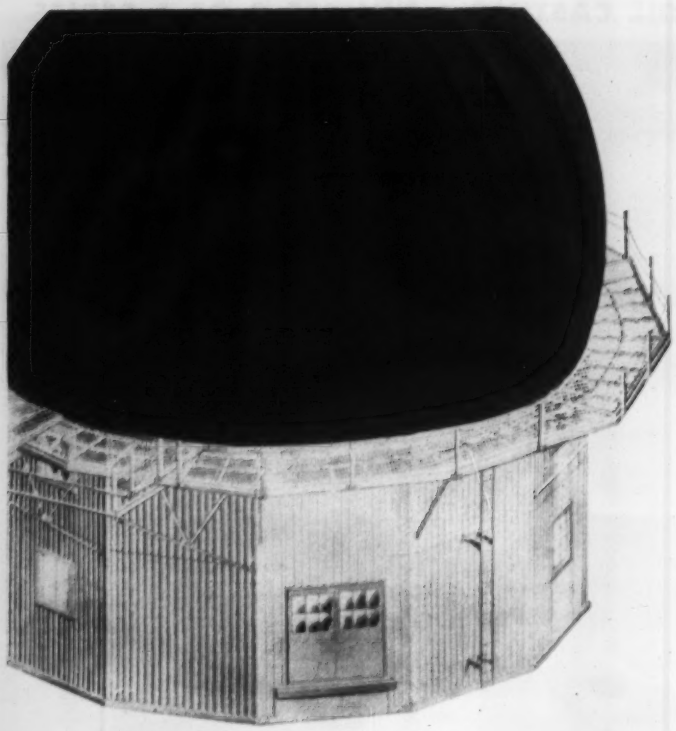
Send for your copy

The New Jersey Zinc Company 160 Front St., New York 38, N. Y.

ZINC
FOR DIE CASTING ALLOYS

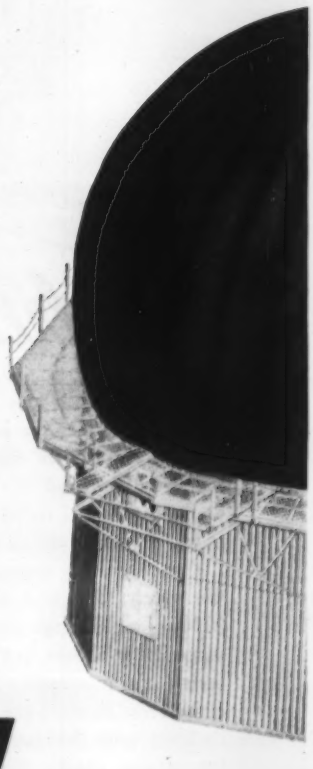
The Research was done, the Alloys were developed, and most Die Castings are based on

HORSE HEAD SPECIAL (99.99 + % Uniform Quality) ZINC



ON GUARD above the Arctic Circle, Air Force radar station features flexible neoprene-and-fiberglass dome which pulsates to dislodge ice and snow.

Radar dome shrugs off 100-mph gales at sentry post on roof of the world!



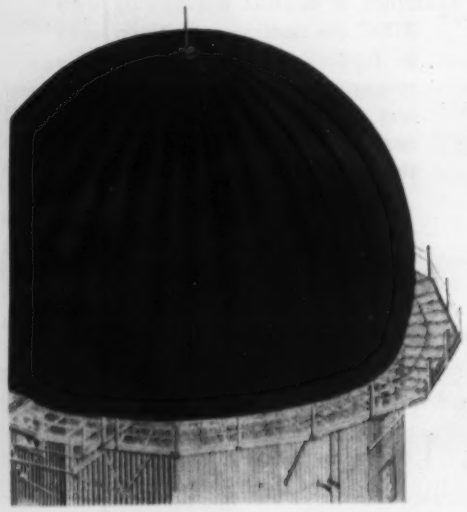
RB&W bolts hold tight on critical fastening job

You'll never read a headline about RB&W bolts and nuts in U. S. Air Force radar domes strung across the top of the world. But the men who build the odd-shaped structures—Dresser-Ideco Co. of Columbus, O.—know that their ability to withstand the cruelest weather on earth stems largely from these work-a-day fasteners.

C. Daniell Byrd, Dresser-Ideco's sales promotion manager, puts it in these words:

"Keynote of our planning is rugged construction. RB&W bolts offer superior size and dimensional stability. Since the parts *must* fit, RB&W's consistent product uniformity adds an essential 'plus' to the strength and performance of these bolts."

Maybe your product doesn't have to withstand 100-mph Arctic blasts. Wherever it's used, however, it will do a better job for a longer time if you put it together with RB&W fasteners. We'll be glad to show you how. RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY, Port Chester, N. Y. 4.12

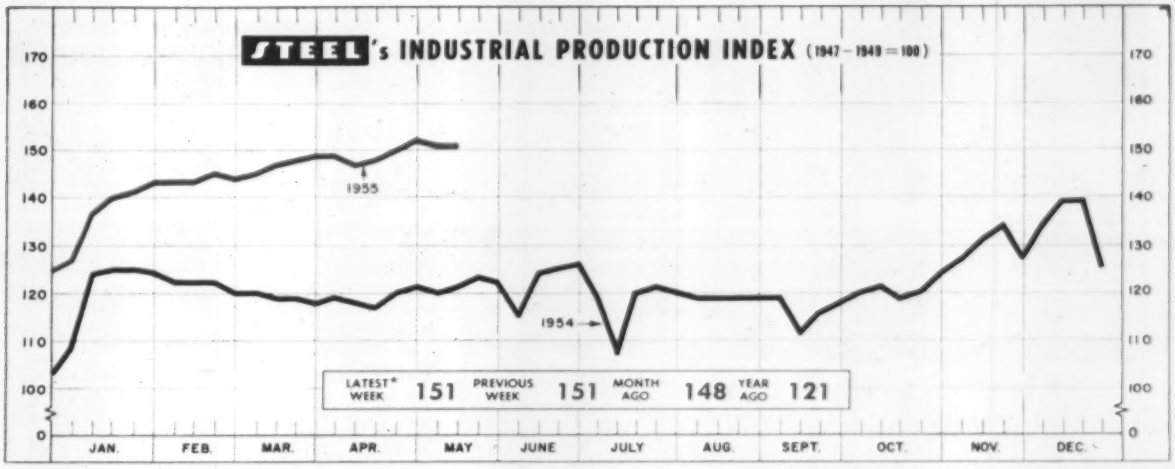


RB&W

RUSSELL, BURDSALL & WARD

110 Years Making Strong the Things That Make America Strong

Plants at: PORT CHESTER, N. Y.; CORAOPOLIS, PA.; ROCK FALLS, ILL.; LOS ANGELES, CALIF. *Additional sales offices at:* ARDMORE (PHILA.), PA.; PITTSBURGH; DETROIT; CHICAGO; DALLAS; SAN FRANCISCO. *Sales agents at:* NEW ORLEANS, DENVER, SEATTLE. *Distributors from coast to coast.*



*Week ended May 14. Based upon and weighted as follows: Steel Output 35%; Electric Power Output 32%; Freight Car Loadings 22%; and Auto Assemblies 11%.

In the Good Old Summer Time: Inventory Building

INVENTORY BUILDING will be an important business mainstay during the summer. The reason: High sales for most branches of industry, with the good possibility of a strong fall buying surge, call for higher stock levels.

Underneath it all is a strong, still-growing confidence of business men and the public that good times are here to stay. Giving summer business an added push is pent-up demand of some manufacturers who have wanted to build inventory but have been unable to because of the tight supply situation in some materials.

Loosening — With supplies expected to loosen in the third quarter, the tendency will be to buy while material is available. Reinforcing the trend is the forecast of early model changeover in the auto industry again this year. That could cause deliveries to lengthen by fall.

Other incentives to inventory building are the prospect of price rises, possible shortages because of labor difficulties and the unsettled international situation, which is relatively calm now but apt to change at any time.

Under Way — Some inventory building already is under way. In New England, the Federal Reserve Bank of Boston reports inventories in all stages of production are up. In the last check the bank made, between 80 and 90 per cent of replying purchasing agents said they had higher stocks than at the end of the year.

Business confidence is pointed up particularly by rising raw materials inventories and a longer-term buying policy. Hand-to-mouth buying is definitely fading; increasing numbers of orders are being placed two and three months in advance.

Selective—Still, it's no pell-mell race to increase stock on hand. Most of the buying is selective—materials that are likely to be hard to get or likely to go up in price.

The slowness of the increase can be taken as a good sign. It means

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,324	2,345	1,712
Electric Power Distributed (million kw-hr)	9,525[1]	9,586	8,380
Bitum. Coal Output (1000 tons)	8,700	8,575	6,828
Petroleum Production (daily avg—1000 bbl)	6,670[1]	6,688	6,428
Construction Volume (*ENR*—millions)	$458.7	$389.4	$344.0
Automobile, Truck Output (*Ward's*—units)	222,847	215,756	153,796
TRADE			
Freight Car Loadings (1000 cars)	745[1]	741	678
Business Failures (Dun & Bradstreet, no.)	215[1]	237	248
Currency in Circulation (millions)[3]	$29,859	$29,764	$29,759
Dept. Store Sales (changes from year ago)[3]	+9%	+7%	−4%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$18,823	$21,939	$18,516
Federal Gross Debt (billions)	$276.6	$276.7	$271.0
Bond Volume, NYSE (millions)	$17.8	$19.1	$17.0
Stocks Sales, NYSE (thousands of shares)	11,042	11,567	10,098
Loans and Investments (billions)[4]	$84.5	$84.8	$79.9
U. S. Govt. Obligations Held (billions)[4]	$33.6	$34.0	$32.4
TRADE			
STEEL's Finished Steel Price Index[5]	194.53	194.53	189.74
STEEL's Nonferrous Metal Price Index[6]	237.0	237.0	212.6
All Commodities[7]	110.4	110.4	111.0
Commodities Other Than Farm & Foods[7]	115.7	115.7	114.4

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1955, 2,413,278. 1954, 2,384,549. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

NEW

Allenpoint

Set Screws

WITH
SCIENTIFICALLY-DESIGNED
SMALLER CUP POINTS

Smooth, deep point penetration for greater holding power and resistance to vibration; precision formed threads and accurate thread lead for maximum locking action. Comparative tests by leading laboratory prove Allen Set Screws unmatched in performance. Write to Advertising Department for Bulletin C-33A.

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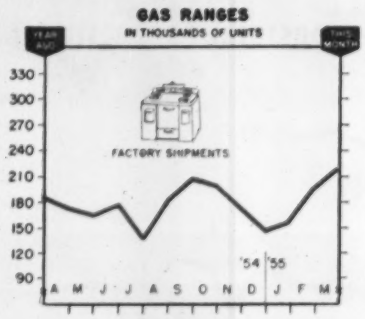
When ordering through your local industrial distributor, specify Genuine Allenpoint Set Screws.

ALLEN

MANUFACTURING COMPANY
Hartford 2, Connecticut, U.S.A.

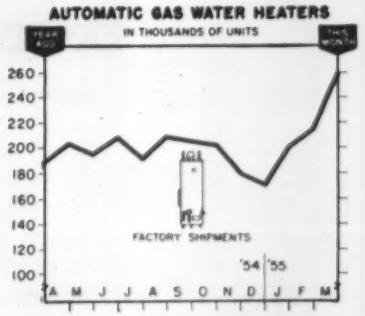
THE BUSINESS TREND



Shipments—Units

	1955	1954	1953
Jan.	152,900	137,000	169,200
Feb.	193,900*	152,900	185,900
Mar.	217,000*	188,200	208,200
Apr.	.....	172,400	220,300
May	.....	163,800	181,000
June	.....	174,300	166,600
July	.....	134,500	159,000
Aug.	.....	179,400	186,800
Sept.	.....	203,900	209,500
Oct.	.....	197,100	203,900
Nov.	.....	174,000	158,500
Dec.	.....	147,300*	134,400
Total	.....	2,024,800	2,183,300

Gas Appliance Mfrs. Assn.
*Preliminary.
Charts Copyrighted 1955 STEEL.



Shipments—Units

	1955	1954	1953
Jan.	200,000	164,400	189,900
Feb.	214,700	175,000	194,200
Mar.	259,600*	187,800	207,400
Apr.	.....	200,800	209,500
May	.....	195,600	183,300
June	.....	206,700	181,200
July	.....	190,300	178,900
Aug.	.....	207,100	168,100
Sept.	.....	205,500	179,000
Oct.	.....	202,000	194,300
Nov.	.....	179,100	155,000
Dec.	.....	166,800	141,900
Total	.....	2,281,100	2,182,700

Gas Appliance Mfrs. Assn.
*Preliminary.

that the business pickup will be sustained. A faster build-up would have dangers of a return to the top heavy inventories of 1953, with the likelihood, also, of a repeat of 1954.

Building: No Letdown . . .

Another strong factor in summer business is construction—still thundering along to new records. F. W. Dodge Corp. reports construction contracts in the 37 states east of the Rockies at $2.3 billion in April. That pushed contract letting so far this year to 35 per cent ahead of a year ago.

Some slowdown is inevitable, but opinion is that it will be mild. "All signs now indicate that 1955 will be one of the greatest construction years in the nation's history," says L. M. Cassidy, chairman, Johns-Manville Corp. "It also appears that this fast pace of construction will continue for some years beyond 1955."

Here's how Thomas S. Holden, vice chairman of Dodge Corp., comments: "I see nothing in the current construction picture to cause any great concern." It now looks that Dodge's estimate of a 6-per-cent gain in construction for this year will be exceeded, he added.

Why the Boom? . . .

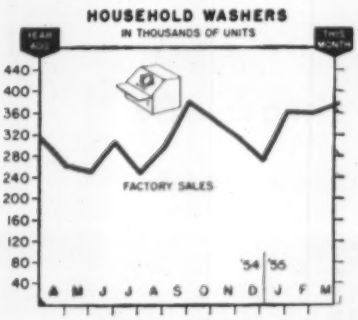
"Recent construction volumes barely have kept pace with the growth of the economy. Last year's record total was only 28 per cent over the peak volume of the boom of the 1920s, after allowance is made for the big change that took place in the value of the construction dollar.

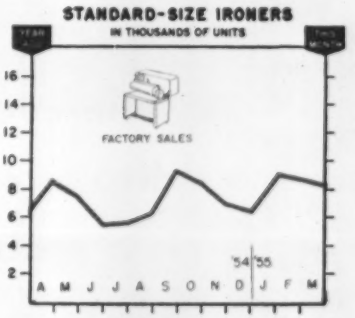
"In the meantime, population has increased 35 per cent; per capita incomes increased nearly 50 per cent; and total output of goods and services more than doubled. Economic growth is the great generator of construction demand."

About fast-paced residential building, he says: "Until unsold houses begin to accumulate in numerous local markets, it cannot be said with assurance that houses are being built too fast."

New Record in May . . .

Heavy construction is moving ahead even faster than total construction. For 19 weeks of 1955, contract volume is 41 per cent ahead of last year, reports *Engineering News-Record*. For the last four weeks, total contracts have averaged $422 million. *ENR* says awards also are expected to hang





Sales Billed—Units

	1955	1954	1953
Jan.	357,354	249,956	277,309
Feb.	353,214	295,171	326,604
Mar.	370,555	307,862	345,989
Apr.	.....	258,712	288,474
May	.....	246,944	286,515
June	.....	303,455	304,086
July	.....	242,863	228,268
Aug.	.....	293,243	291,260
Sept.	.....	379,666	340,532
Oct.	.....	339,189	310,867
Nov.	.....	308,368	238,153
Dec.	.....	264,803	191,570
Totals	.....	3,490,212	3,429,627

American Home Laundry Mfrs. Assn.

Factory Sales—Units

	1955	1954	1953
Jan.	8,648	9,792	24,395
Feb.	8,241	8,208	22,586
Mar.	7,750	6,025	16,066
Apr.	.....	8,388	14,080
May	.....	7,210	9,323
June	.....	5,185	12,529
July	.....	5,227	9,626
Aug.	.....	5,925	8,067
Sept.	.....	8,905	9,113
Oct.	.....	9,021	11,666
Nov.	.....	6,427	10,105
Dec.	.....	5,892	6,908
Totals	.....	86,205	154,464

American Home Laundry Mfrs. Assn.

up a new record for May on top of having set new marks in three of the four previous months this year.

The auto industry finally shows some signs of weakening—but only signs. Production is still at a near-record pace. The strike threat is much in evidence; preliminary skirmishing is under way and the scattered disturbances are probably all that will keep the industry from setting a few more records.

Auto Sales Set Speed Marks . . .

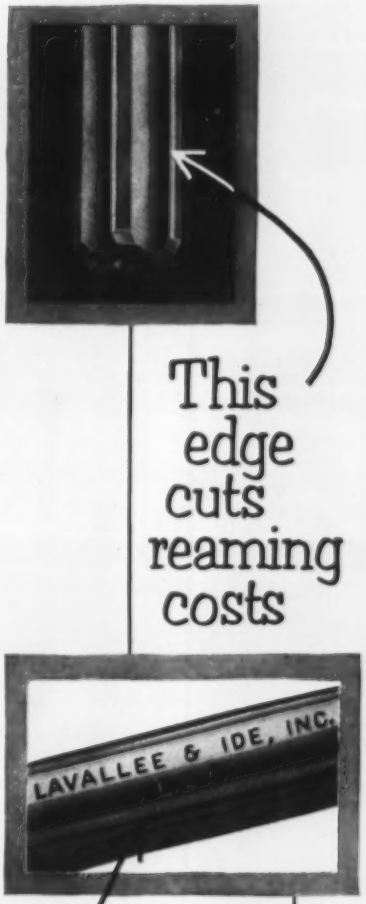
Sales are continuing to boom. April was a record month, says *Ward's Automotive Reports*, with sales of 702,000—or more than 28,300 a day. *Ward's* adds: "Indications are that a new all-time high will be hit this month as sales promotion teams and dealers stimulate business with discounts and bonuses during May's 25 selling days."

April deliveries ran only 7 per cent under production, but inventories pushed to a new peak. At current sales rates there's a 24-day supply, compared with a 31-day supply at the time of the previous high.

Used-car inventories, likewise, are at a peak, but so are sales. If used-car sales stay high, the industry will be in good shape when model changeover rolls around. Otherwise, production may get off to a slow start as dealers unload high stocks of used models.

Trends Fore and Aft . . .

Foundry equipment in March had its biggest month since August, 1953, says the Foundry Equipment Manufacturers Association. New orders nearly doubled those of February . . . For the third straight month Dun & Bradstreet Inc. reports fewer business failures than in the same 1954 month . . . John C. Vander Pyl, president, American Machine & Metals Inc., New York, says: "Our backlog of unfilled orders is equivalent to about four months of production at the existing rate of monthly shipments". . . P. T. Egbert, president, Alco Products Inc. (formerly American Locomotive Co.) says orders booked during the first quarter were at the highest level for any quarter during the last 15 months . . . Executive Vice President John B. Huarisa, Admiral Corp., Chicago, forecasts a 10-to-20-per-cent increase in business in the second half compared with the same period last year.



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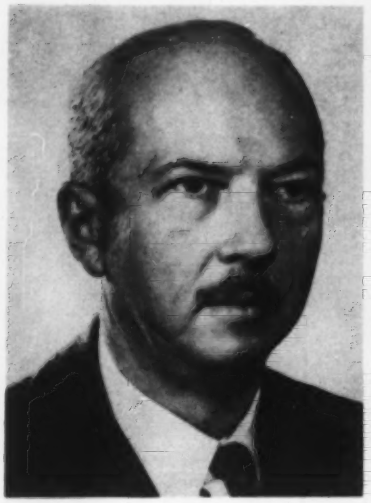

McCLURE KELLEY
. . . B-L-H president

HARLESTON R. WOOD
. . . heads Alan Wood Steel Co.

FRANK W. GLASER
. . . Alloy Precision Castings v. p.

Baldwin-Lima-Hamilton Corp., Eddystone, Pa., elected **McClure Kelley** president. Formerly executive vice president, he succeeds **Marvin W. Smith**, now chairman of the executive committee. **Robert G. Tabors** and **Arthur Clements** were elected vice presidents of the Hamilton, O., Division. Mr. Tabors was assistant general manager at Hamilton; Mr. Clements was vice president-general manager of Clearing Machine Corp.'s Hamilton plant.

Ralph W. Burk fills the new post of executive vice president of **Kearney & Trecker Corp.**, Milwaukee. He was vice president in charge of sales and manufacturing. **Raymond L. Bischoff** was elected financial vice president, continuing as secretary-treasurer.

John Woodward was made works manager, a new post at **McCulloch Motors Corp.**, Los Angeles. He is succeeded as factory superintendend by **Jack Southwell. Cooper Gwin**, acting director of materiel, becomes director of that department.

Detroit Steel Corp., Detroit, appointed **Lloyd A. Martz** manager of sales, sheet and strip steel; **Rudolph J. Herbenar**, assistant manager, Detroit district sales office. **Robert A. Crawford** was made superintendent in charge of flat rolled products at the Portsmouth, O., division.

Alan Wood Steel Co., Conshohocken, Pa., elected **Harleston R. Wood** president and chief executive officer. He was vice president in charge of planning and development. **John T. Whiting**, president since 1939 and chairman since 1941, continues as chairman and a director.

E. B. Cottingham was elected president, **Henry Pratt Co.**, Chicago, to succeed **S. B. Smith**, now chairman of the board. Mr. Cottingham was vice president-production.

Ajax Flexible Coupling Co. Inc., Westfield, N. Y., elected **Wayne Belden** president; **Charles W. Belden**, vice president; **Harley E. Northrop**, treasurer; and **Robert G. Cady**, secretary.

William A. Martin was elected president, Marine & Industrial Engine Division, **Chrysler Corp.**, Detroit, and also was made general manager of the company's Trenton, Mich., plant.

Horace A. Tennes becomes division manager of **Shafer Bearing Division**, Chain Belt Co., Downers Grove, Ill. He succeeds **Ray P. Tennes**, retired. **John N. Tufts** was made sales manager.

Turley L. Angle was made assistant general manager, **Raycon Corp.**, Belmont, Calif.

Frank W. Glaser was elected a vice president and director of **Alloy Precision Castings Co.**, Cleveland. He is in charge of new development, engineering and production operations.

Penn Machine Co., Pittsburgh, elected **E. Gard Slocum** vice president-planning, product and plant development. He was chief industrial engineer for Jones & Laughlin Steel Corp.

Wilbur J. Walkoe was named president, **Pyramid Mouldings Inc.**, Chicago. He was vice president-general manager. **I. L. Reed**, past president, becomes chairman of the board. **Frank T. Astrella** fills the post of vice president and continues as general sales manager.

Richard S. Moore was named general sales manager, **Harbison-Walker Refractories Co.**, Pittsburgh.

Steve Jerome was made general manager of **Wagner Bros. Equipment Co.**, Detroit.

Cleveland Instrument Co., Cleveland, appointed **David M. Gaskill** sales manager; **Robert F. Baskin**, manufacturing manager in charge of engineering and production. Mr. Gaskill, formerly with Brush Electronics Co., takes over promotional activities previously handled by **C. Thorpe Thompson**, executive

WALTER F. MARTIN
. . . Morse Twist Drill p. a.

HOWARD H. CASEY
. . . Midvale v. p.-sales

J. W. LELIVELT
. . . Kelvinator manufacturing mgr.

vice president. Mr. Baskin also was with Brush Electronics.

Walter F. Martin was made purchasing agent of **Morse Twist Drill & Machine Co.**, New Bedford, Mass. Formerly assistant purchasing agent, he succeeds **R. E. Zilly**, now purchasing agent at Brown University.

William H. Worrilow Jr. was made vice president-sales, **Lebanon Steel Foundry**, Lebanon, Pa. **Harry L. Quinn** succeeds his father, the late **Thomas Sydney Quinn**, as treasurer, and continues as general manager. **John H. Boyd** succeeds Mr. Worrilow as general sales manager.

William A. Yost Jr., vice president-general machinery division, fills a new post of vice president, staff operations, at **Allis-Chalmers Mfg. Co.**, Milwaukee.

William P. Cook III succeeds **Walter J. Delehanty**, retired, as manager of **General Electric Co.'s** wire and cable plant, Oakland, Calif.

Patrick V. Gallagher was made chief engineer, **Dwight-Lloyd Division**, McDowell Co. Inc., Cleveland.

Fred W. Bush was elected vice president-general manager, **Vinson Steel & Aluminum Division**, Vinson Supply Co., Dallas.

Sig Straus was made national sales manager, **Larkin Welder & Machine Co.**, Brooklyn, N. Y.

Howard H. Casey, director of sales and engineering, **Midvale Co.**, Philadelphia, was elected vice president-sales. He continues as director-engineering.

R-S Furnace Co. Inc., Philadelphia, elected **S. M. Stoler** president, **Harold E. Curll** vice president, and **R. M. Boyd** secretary.

Drew M. Thorpe was made executive vice president of **General Refractories Co.**, Philadelphia. **Lee A. Diehl** was made vice president-controller. **G. R. Rittenhouse** succeeds Mr. Diehl as assistant secretary and assistant treasurer.

H. W. Gethin was made Pittsburgh district sales manager at **Lacledе-Christy Division**, H. K. Porter Company Inc.

A. B. Keckley, general manager, and **W. M. Ferguson**, sales manager, were elected vice presidents of **Texas Electric Steel Casting Co.**, Houston.

Ralph D. Parker was elected vice president, **International Nickel Co. of Canada Ltd.**, Copper Cliff, Ont. He continues as general manager of the Canadian operations. **Walter A. McCadden** was made comptroller.

Robert R. Estill was elected president of **Green River Steel Corp.**, Owensboro, Ky. He succeeds **Sidney D. Williams**, who becomes vice chairman of the board. Mr. Estill retired from U. S. Steel Corp.

J. W. Lelivelt fills the new post of manufacturing manager for **Kelvinator Division**, American Motors Corp., Detroit. He was works manager of the Grand Rapids, Mich., plant, and is succeeded by **George H. Beld.**

Arthur G. Paugh was made assistant director of purchases of **Vanadium Corp. of America**, New York. He was purchasing agent of Rockwell Mfg. Co.'s National Meter Division.

Ralph A. Creter was made plant metallurgist for Republic Steel Corp.'s **Union Drawn Steel Division** plant in Beaver Falls, Pa. He succeeds the late **Harold Seyler.**

Frank Lang Jr. was made resident plant manager of **Brooks Equipment & Mfg. Co.**, recently acquired subsidiary of Borg-Warner Corp. at Knoxville, Tenn. He was plant superintendent and personnel manager of Wausau Mfg. Co., another subsidiary.

Edward B. Wilber succeeds the late **Gordon W. Cameron** as treasurer of **Aluminum Co. of America**, Pittsburgh. Mr. Wilber was manager of pig and ingot sales.

Milton E. Mengel was made vice president, **Burroughs Corp.**, Detroit, in charge of product planning.

Arthur R. Lytle was made vice president - research for **Electro Metallurgical Co.**, a division of

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Mills, Drills, Bores, Taps, 2 and 4 Barrel Intake Manifolds

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. . . Rigidized Metals v. p.-treasurer

ROY O. SCHIEBEL
. . . sales manager at Magnaflux

FRANK J. HODER JR.
. . . gen. mgr. at Micro-Precision

Union Carbide & Carbon Corp., New York.

Donald H. Campbell, comptroller, **Rigidized Metals Corp.,** Buffalo, was elected vice president-treasurer.

Charles B. Tansley was elected president, **Bryant Machinery & Engineering Co.,** Chicago, to succeed **Martin J. Wiora,** now chairman.

Val C. Sommers was made purchasing manager, **Le Roi Division,** Westinghouse Air Brake Co., Milwaukee.

I. John Billera was elected vice president-treasurer of **U. S. Industries Inc.,** New York.

Howard F. Kulas Jr., formerly manager of original equipment manufacturer sales for Weatherhead Corp., joined **Cleveland Metal Abrasive Co.,** Cleveland, in a management capacity with operating, technical and sales responsibility.

Roy O. Schiebel was made sales manager, **Magnaflux Corp.,** Chicago. **Lloyd J. Oye** resigned to take a position with Rezolin Inc., Los Angeles. Mr. Schiebel was in New York as eastern district and export manager.

White Motor Co., Cleveland, elected **Robert F. Black** to the new position of chairman. He continues as president and chief executive officer. **J. N. Bauman, V. W. Fries** and **E. S. Reddig** were named executive vice presidents. They, with Mr. Black, constitute the operating committee.

G. T. Flammia was elected vice president-general manager, **Sossner Tap & Tool Corp.,** Lynbrook, N. Y.

Chicago Vitreous Corp., Cicero, Ill., elected **E. E. Howe** vice president.

John H. Morava was made Chicago district sales manager for **United States Steel Corp.**

Frank J. Hoder Jr. was made general manager of Micromatic Hone Corp.'s **Micro-Precision Division,** Evanston, Ill. He was sales manager in 1953 when Micro Precision Inc. became a subsidiary of Micromatic.

E. T. Lippert Saw Co., Millvale, Pa., elected **Fred L. Pfischner** president; **Robert D. Pfischner,** vice president-secretary; and **F. J. Pfischner,** treasurer.

Earle D. Moiles Jr. was made Boston district manager, **Leeds & Northrup Co.,** to replace **Paul K. Welch,** now manager at New York.

Donald W. Saladin was made assistant general superintendent of **National Tube Division's** Christy Park Works, McKeesport, Pa., U. S. Steel Corp.

W. H. Cook was made assistant sales manager, steel strapping division, the **Stanley Works,** New Britain, Conn.

OBITUARIES . . .

Leigh R. Evans, 71, senior vice president of **Hardinge Bros.,** Elmira, N. Y., died May 1.

L. E. Emerich, 56, director of marketing, **Leeds & Northrup Co.,** Philadelphia, died May 5.

A. T. Rogers, 86, board chairman of **Rogers Galvanizing Co.,** Tulsa, Okla., died recently in Ft. Lauderdale, Fla.

Charles M. Lewis, 61, president, **Badger Malleable & Mfg. Co.,** Milwaukee, died May 11.

Harry R. Badger, 57, a vice president of **Fruehauf Trailer Co.,** Detroit, died May 7.

J. M. Schlendorf, 69, retired vice president, **Republic Steel Corp.,** Cleveland, died May 16.

Ramsey J. Taylor, 78, retired president, **Taylor Machine Products Inc.,** Montebello, Calif., died May 3.

Herbert C. Plummer, 51, director of the office of public information and reports, **General Services Administration,** Washington, died May 7.

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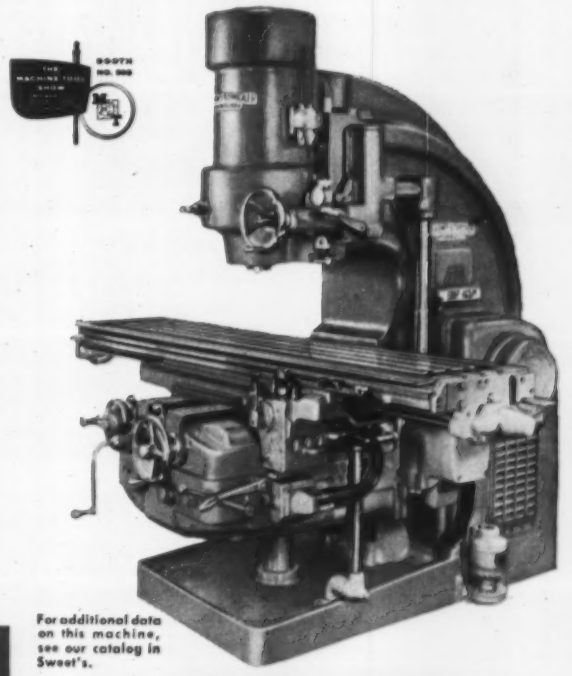

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4147 vertical milling machines	13%	37%	50%
5319 knee type horizontal milling machines	25%	39%	36%
725 bed type milling machines	15%	42%	43%
682 horizontal and vertical precision boring machines	37%		63%

Figures adapted from 1953 American Machinist survey of metalworking industry.

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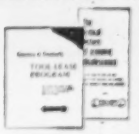

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Stran-Steel Reorganizes

Creates customer service department, augments engineering staff, reassigns executives

GREAT LAKES STEEL CORP.'s Stran-Steel Division, Detroit, is expanding its organization to provide additional customer service, product engineering and dealer development. The division, which makes prefabricated buildings, is headed by Charles LeB. Homer.

A newly created customer service department will be headed by Max Luft, formerly assistant sales manager. The division's engineering staff is being augmented to develop new building designs and product improvements. Its executive personnel is being reorganized to function as a staff-and-line operation.

The line organization will be headed by R. L. Crom, Stran-Steel Division field sales manager. Appointed to the division's executive staff are: Julius Skaaren, division manager of building sales; E. D. Pieri Sr., manager of Stran-Steel framing sales; S. B. Taylor, manager of business and marketing research.

Crucible Opens Field Office

Crucible Steel Co. of America, Pittsburgh, established a sales field office at 1313 Jefferson Ave., Toledo, O., as a division of its Cleveland sales branch. Jack H. Rolfe has been named resident salesman in the new office.

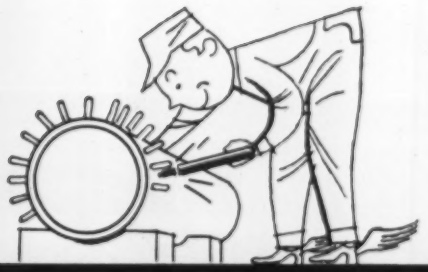
Buffalo Firm Plans To Move

Hohl Machine & Conveyor Co. Inc., Buffalo, purchased the former New York Car Wheel Co. building in Buffalo as part of a $100,000 expansion and consolidation program. The firm plans to move into the 30,000-sq-ft building soon.

Puts Plant on Stand-by Basis

Large-scale maintenance preparations are under way at the Chrysler-managed Detroit tank plant to place it on a stand-by basis for United States Army Ordnance. The stand-by program for the plant was put into effect Mar.

(*Please turn to page* 88)



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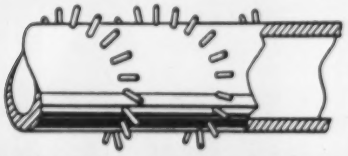

If your product requires teeth, "dogs," or welded projections of any sort, call in a Nelson Field Engineer. He will be glad to study your product design and advise how the NELWELD® System can be used to your advantage. Mail the attached coupon for complete information.

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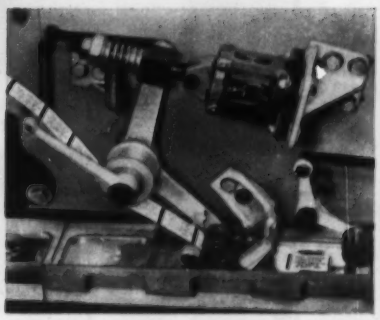
1. "SCOTCH" CELLOPHANE TAPE comes in many special types. Above, for example, No. 685 Riveters' Tape holds rivets in place in spite of vibrations. Tape has adhesive on edges only; clear center does not stick to rivets; edges strip off clean in 2 easy pulls.



5. ACETATE FIBRE TAPE comes in 12 colors and transparent; can be printed easily. Above: Automatic applicator delivers predetermined lengths (labels) at production-line speeds. Tape is tight-holding; moisture resistant; meets Gov't. Specification JAN-P-127.

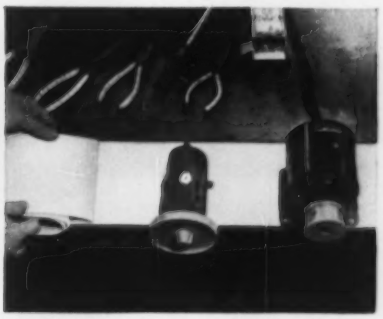
6. PLASTIC TAPES are available with many special properties: to resist acids, abrasion, alkalies, solvents, or combinations of these. Tape above is No. 470 Electroplating Tape for stop-off masking in plating. Thin, tough, stretchy —sticks at a touch!

useful tool in your plant?

There are "SCOTCH" Brand Pressure-Sensitive Tapes to hold, seal, bind, mask, bond, bundle, protect, reinforce —in fact, to do hundreds of jobs in thousands of different ways. And wherever you use them, you'll profit through lowered costs, faster production, or improved products. What's more, these "tape tools" are even more valuable when you use automatic or semi-automatic tape applying equipment. We'll be glad to show you how such equipment can turn many a manual operation into a production-line step literally overnight. No cost or obligation, of course. Just check the coupon and drop it in the mail.

2. MASKING TAPES have flexible creped backings to allow them to fit curves and irregular surfaces easily. Above, High Heat Masking Tape No. 214 protects chrome on cash register; withstands temperatures up to 375°F. for several bakes; leaves no residue.

3. FILAMENT TAPE is a superior heavy-duty holding, bundling, and reinforcing material. Up to 500 lbs. tensile strength per inch of width; exclusive "mirror surface" adhesive sticks at a touch; puts all the strength to work. Tape won't mar products or cut hands.



4. DOUBLE-COATED TAPES give you *two* sides of the strongest adhesive on any pressure-sensitive tapes. Above, Tape No. 400 holds repaired motors and generators on testing bench; eliminates need for time-consuming drilling, bolting, and unbolting.

There are more than

300 PRESSURE-SENSITIVE TAPES

for industry, trademarked...

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BRAND

Order "SCOTCH" Brand Pressure-Sensitive Tapes from your regular distributor or mail coupon for further information

MINNESOTA MINING AND MFG. CO. GK-55
St. Paul 6, Minnesota

Please send me complete information on the tapes and applications checked:

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COMPANY.....

ADDRESS.....

CITY.....ZONE...STATE.....

The term "SCOTCH" is a registered trademark of Minnesota Mining and Manufacturing Co., St. Paul 6, Minn. Export Sales Office: 99 Park Ave., New York 16, N.Y. In Canada: P.O. Box 757, London, Ontario.

Look to *ESCO* for everything you need in Hastelloy B & C super alloy castings. Conventional, Shellcast and centrifugal castings are available to meet your most exacting requirement. You get prompt delivery—even on small orders.

Hastelloy fittings are available from stock—standard flanged, screwed and welded fittings can be delivered fast from conconveniently-located warehouses.

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Look to *ESCO* for everything you need in stainless and high alloy steels. Ask our high alloy engineers to make a complete study of your corrosion problems. Call your nearest *ESCO* office for details.

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Portland Manufacturing Plant

Other Offices and Warehouses
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San Francisco, Calif.
Seattle, Spokane, Wash.
Houston, Texas
Eugene, Oregon
Salt Lake City, Utah
Honolulu, Hawaii
In Canada: Vancouver, British Columbia and Toronto, Ontario.

(*Concluded from page* 85)

31 when production of T-51 heavy-tank retrievers was completed.

This will become the second largest stand-by defense manufacturing installation in the country, having 1 million sq ft of manufacturing space and 1500 production machines. The largest is the Chrysler-managed, 2-million-sq-ft tank engine plant in New Orleans.

American Locomotive Renamed

American Locomotive Co., New York, changed its name to Alco Products Inc. While locomotive production continues to be a major operation, Alco makes products for more than a dozen major markets. Over three-fourths of the company's 1954 output of regular products was in new lines.

Birmingham Firm To Make Cans

Southern Can Corp. has been organized in Birmingham to produce cans for the oil, paint, chemical, food and beverage trade. The corporation has leased a building and will begin installing equipment soon. Operations are scheduled to start about Sept. 1. J. D. Stewart Jr. is president.

Baltimore Fabricator Expands

Aircraft Armaments Inc. is erecting a 14,000-sq-ft addition to its new plant at York and Cherry Tree roads, Cockeysville, Baltimore county, Md. The company is a subsidiary of Hayes Mfg. Corp., Grand Rapids, Mich. Joel M. Jacobson is vice president and general manager of aircraft armaments.

Anocut Engineering Formed

Anocut Engineering Co. is a newly organized firm with executive offices in the Board of Trade building, Chicago. Laboratory and manufacturing facilities are at 631 W. Washington Blvd., that city.

Since the first of the year, the firm has been engaged in the development and manufacture of equipment for automatic electronic control of electrolytic shaping systems. Electrolytic shaping has been responsible for drastic reduction in the cost of grinding and

30,000 lb. capacity Yale Truck feeds heavy coil of sheet steel into upender in cold strip mill.

Yale Giant Electric Ram Lifts, carries 15-ton steel coil

COMPLETE LINE OF YALE TRUCKS MEETS EVERY HANDLING NEED OF THE METALS INDUSTRY.

In receiving areas, scrap and plant yards, foundries, production lines, warehouses and loading docks, versatile YALE Trucks lift, move, stack all types of materials with sure, smooth power—in many instances cutting handling costs as much as 75%.

To modernize and integrate your materials handling program, you can pick exactly the equipment you need from YALE's electric, gas and diesel trucks—the most complete line available. Electric Truck capacities range from 1,000 to 100,000 lbs.; Gas Trucks, 1,000 to 10,000 lbs.—with job-specified attachments available for materials of any size or weight. For more details, call a YALE representative today or mail coupon today.

YALE * **INDUSTRIAL LIFT TRUCKS AND HOISTS**

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Gas, Electric, Diesel & LP-Gas Industrial Trucks • Worksavers Warehousers • Hand Trucks • Hand & Electric Hoists

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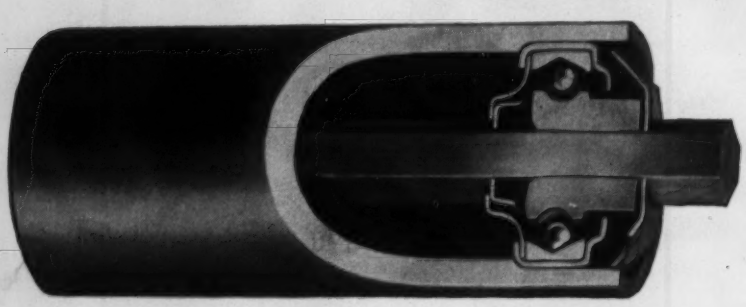
In Canada write: The Yale & Towne Manufacturing Co. St. Catharines, Ontario, Canada

STANDARD'S SHIELDED BEARINGS

Are Expressly Designed for Foundry Conveyor Service



Every Standard roller conveyor is equipped with specially designed bearings that provide the maximum of protection and durability in foundry service. Spillage of hot iron is guarded against by special steel shields. These convex shaped shields fit into the ends of rollers to repel foreign matter. An exit for small particles is provided by an opening at bottom of shield.

Foundry conveyors are designed and built in their entirety by Standard—in a wide range of sizes, weights and types. You can depend on Standard for the right conveyor for your needs — we have been designing and building foundry conveyors since 1906.

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General Offices: N. St. Paul 9, Minn.
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Engineered Conveyor Systems • Portable Conveyor Units • Spiral Chutes • Pneumatic Tube Systems

Send for Standard's special catalog "Conveyors for Foundries" — a valuable reference book illustrating and describing conveyor installations in leading foundries.

Write Dept. ST-55

Standard
GRAVITY & POWER
CONVEYORS

ENGINEERED FOR LOW-COST PRODUCTION

working such hard-to-grind materials as the carbides, titanium, alloy steels and the new "honeycomb" materials.

Alcoa Installs Foil Mills

Keeping pace with the steady increase in demand for aluminum foil, Aluminum Co. of America, Pittsburgh, installed new, 72-in., 4-high foil mills at its Alcoa, Tenn., plant. They are capable of producing foil 60 in. wide for pack-rolled foil and 60.75-in. wide for single-rolled foil.

Glenn L. Martin Expanding

Glenn L. Martin Co., Middle River, Md., manufacturer of aircraft, guided missiles and similar products, appropriated $5.5 million for plant expansion. Much of the work is to be completed this year. Program includes 100,000 sq ft of engineering space, costing about $3 million, and additional laboratory and test facilities.

General Controls Opens Branch

General Controls Co., automatic controls manufacturer, Glendale, Calif., celebrated its twenty-fifth anniversary by opening an enlarged branch in Cleveland. The building at 4317 Chester Ave. houses the regional office, warehouse and a laboratory.

Seeks Materials of Tomorrow

Union Carbide & Carbon Corp., New York, is building research laboratories at Parma, O., a suburb of Cleveland. They will be managed by National Carbon Co., a division. Laboratories will do basic, exploratory work on metallic and nonmetallic compounds of carbon and analogous compounds, such as intermetallics and semiconductors. Dr. R. G. Breckenridge will be in charge.

Brubaker Buys Machine Works

Brubaker Tool Corp., Millersburg, Pa., acquired Morton Machine Works of Detroit and will operate it as a division. The Morton firm designs and produces parts, clamps, clamp assemblies

Newest idea in seamless tube production

Looking for improved methods of tube and pipe making?

Applying the three-roll arrangement for high speed continuous tube and pipe rolling mills is only one of our recent firsts in mill design.

Bringing new developments to bear on your tube mill problems is second nature for Mannesmann-Meer. Nowhere else is the combination of

- **CREATIVE ENGINEERING**
- **DESIGN EXPERIENCE**
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available and ready to go to work for you. Call on Mannesmann-Meer Engineering & Construction Company, 900 Line Street, Easton, Penna. M-44

MANNESMANN-MEER

World Specialists in High-Speed Tube Mill Machinery

BIRDSBORO can help you cut costs

with more *automatic* operation

Tonnage from this BIRDSBORO 3-high mill is raised substantially by semi-automatic features. These include tilting table, side guard manipulators, finger lift for turning square and rectangular shapes, and auxiliary manipulator for turning diamonds and squares.

Savings in labor costs, higher quality and dependable performance are other advantages you can count on when you call in BIRDSBORO engineers for anything from a single unit to a complete plant.

Designers and Builders of:

STEEL MILL MACHINERY
HYDRAULIC PRESSES
CRUSHING MACHINERY
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STEEL CASTINGS
Weldments "CAST-WELD" Design
ROLLS: Steel, Alloy Iron, Alloy Steel

MM-42-55

BIRDSBORO

BIRDSBORO STEEL FOUNDRY & MACHINE CO., BIRDSBORO, PENNA. Offices in Birdsboro, Pa. and Pittsburgh, Pa.

and fixture components for the automotive, aircraft and metal machining industries. Brubaker Tool is developing a program for the production of single-point, carbide-tipped lathe tools.

REPRESENTATIVES

Beryllium Corp., Reading, Pa., appointed James J. Backer Co., Seattle, sales representative for its wrought, beryllium-copper mill products and beryllium-copper casting ingot in Pacific Northwest.

Electric Regulator Corp., Norwalk, Conn., appointed H. M. Richardson & Co., Minneapolis, as sales representative.

Zurn Services Inc., east coast marketing organization for the engineered plumbing, industrial and marine products of J. A. Zurn Mfg. Co., Erie, Pa., appointed F. P. Glazebrook as district sales manager at Newark, N. J.

Bloom Engineering Co. Inc., Pittsburgh, appointed Robert Warnock Co., Birmingham, as its sales representative in that area for its combustion equipment.

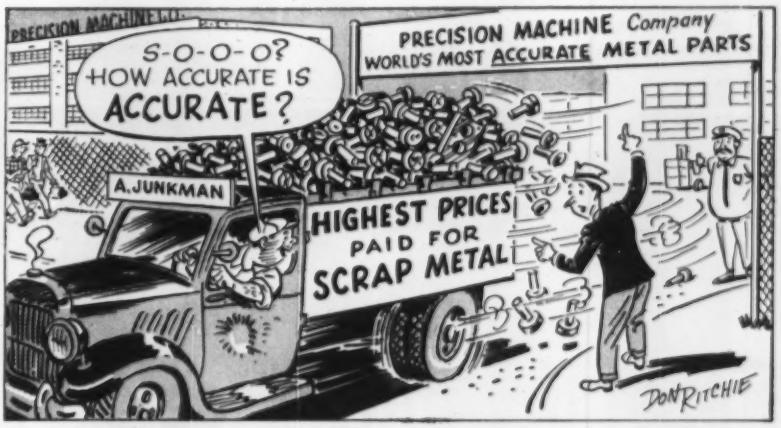
Atlas Valve Co., Newark, N. J., appointed Stanley M. Proctor, Cleveland, as its representative in the Ohio area.

Republic Steel Corp.'s Berger Division, Canton, O., appointed Electric Constructors Inc., Birmingham, and Boyd Corp., Portland, Me., as distributors for its steel kitchens.

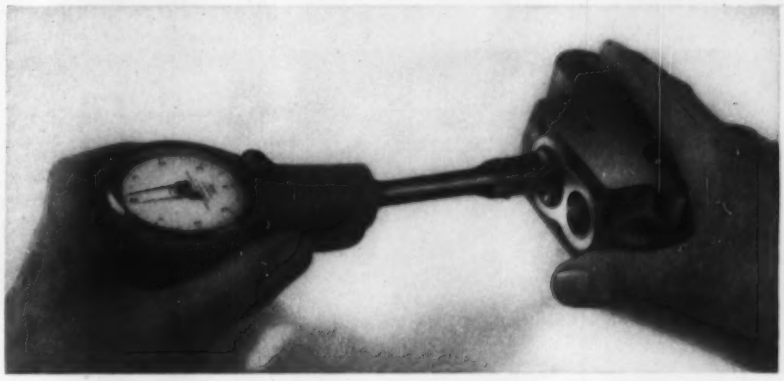
Alloy Precision Castings Co., Cleveland, appointed Hopper & Son, Pittsburgh, sales representatives in western Pennsylvania, northern West Virginia and southeastern Ohio.

R. E. Uptegraff Mfg. Co., Scottdale, Pa., appointed the following sales agencies: Virgil Marshal, Indianapolis; Benson, Funk & Associates, Newton, Mass.; W. W. Jackson, Southbury, Conn.; Eads Co., Houston; Commercial Engineering Co., Washington; Moreland Engineering & Sales Co., York,

(*Please turn to page* 96)



PRECISION IS RELATIVE! A specified dimension is something that's shot at but seldom hit. That's why you allow tolerances . . . and use gages to see how close you're coming. But some gages also vary in accuracy when you get them and after you use them for a while. That's why Federal makes its gages to definite performance tolerances. We build gages *to hold their accuracy constantly* over long periods of time — not just to be accurate at the start . . . to sell at a price.



WE STANDARDIZE ON DIAMOND CONTACTS for this hole gage because they resist wear many times longer than conventional steel contacts. We *can* supply steel contacts. But why should gage users save a few dollars on soft contacts and lose money when gage wear quickly causes the passing of out-of-tolerance work and more frequent checking and resetting of gages? Manufacturers with an equally high regard for the dimensional quality of their work prefer Federal's higher standards.

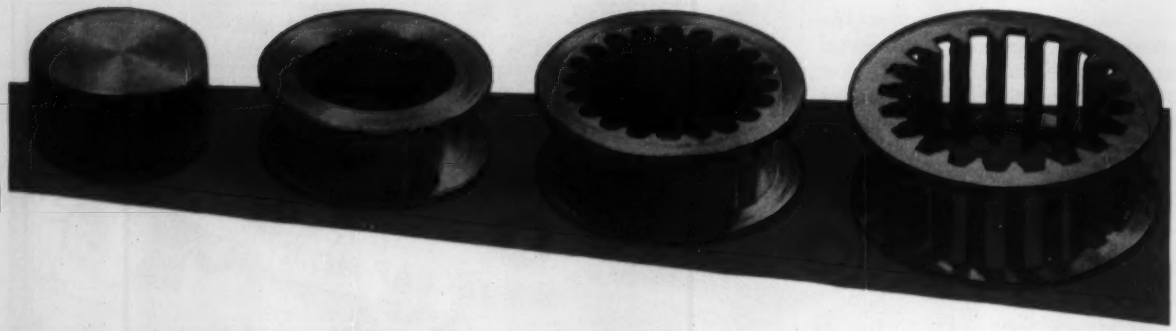
COMPARE GAGE STANDARDS BEFORE YOU BUY! You'll find that all Federal Gages incorporate the proved design principles that mean closer original tolerances, more lasting accuracy and easier adjustments per dollar. Whether your gaging requirements call for Dial Indicating, Air, Electric or Electronic Gages, there's a Federal Gage that will satisfy your needs. Ask your nearby Federal sales engineer for his unbiased recommendation.

FEDERAL PRODUCTS CORPORATION
5215 Eddy Street, Providence 1, R. I.

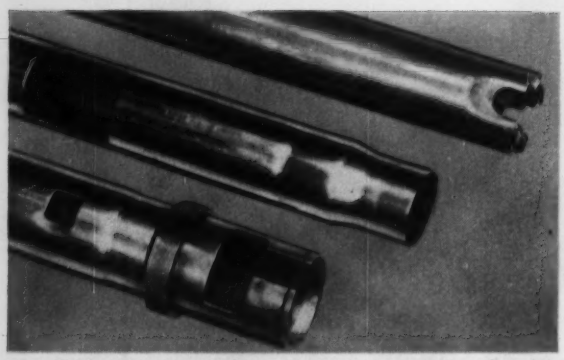
Ask **FEDERAL**

FOR ANYTHING IN MODERN GAGES..

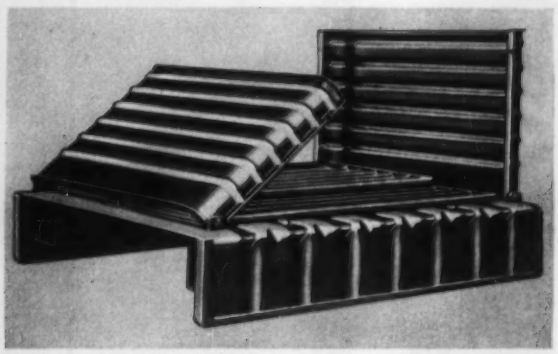
Dial Indicating, Air, Electric, or Electronic—for inspecting, measuring, sorting, or automation gaging



Republic Alloy Steels help Johnson make dependable



YOU CAN SAVE ON TUBULAR PARTS LIKE THESE when Republic does the tube fabricating. Republic's Steel and Tubes Division is equipped to handle all kinds of tough fabricating jobs—has the machinery, the experience and the ability to work out the most economical method of making quality tubular parts. And that includes complete assemblies.



SAVE UP TO 66% OF YOUR STORAGE SPACE with Republic Collapsible Boxes. This PB-127 unit solves the problem of storing and shipping emtpy boxes. It's designed for heavy-duty service. Can be tiered when loaded or empty—collapsed or set up. It is a one-piece unit. Pin and slide belt arrangement assures positive locking.

REPUBLIC STEEL CORPORATION
3120 East 45th Street
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REPUBLIC STEEL

Please send more information on:

☐ Cold Drawn Alloy Bars ☐ Boxes and Skids
☐ Mechanical Tubing ☐ Free-Machining ENDURO®

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Company_____

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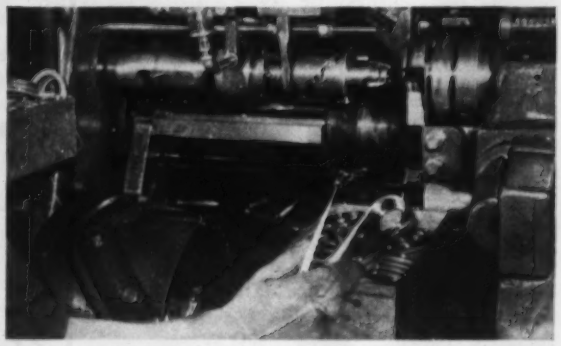
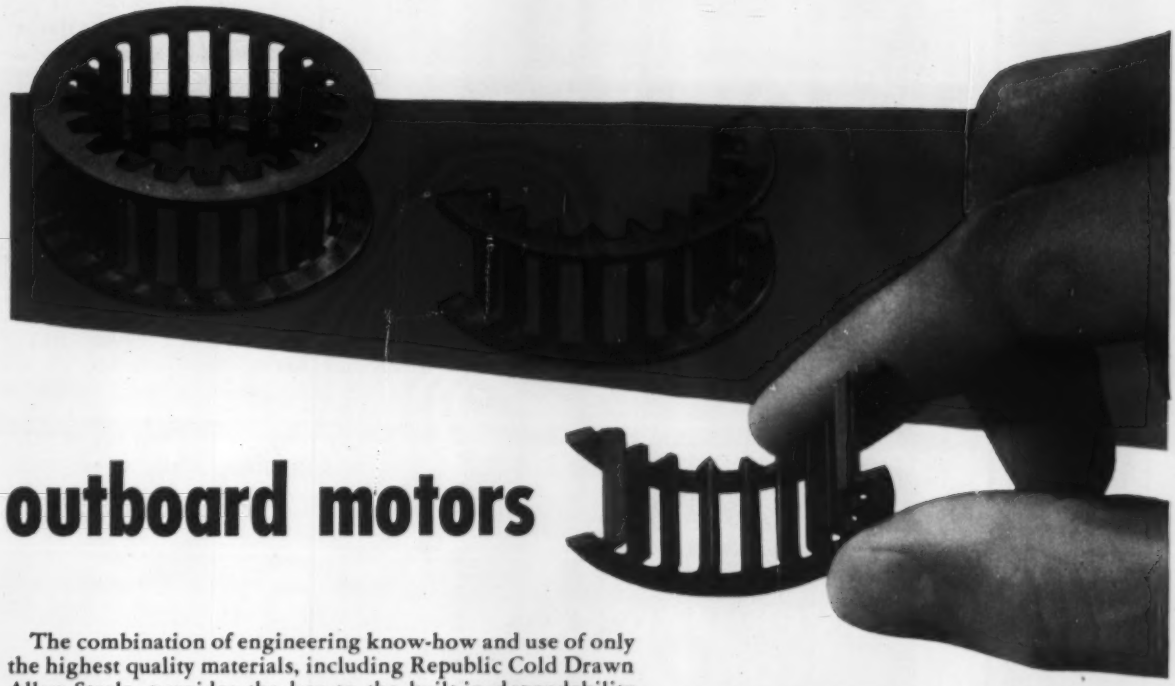


GIVE YOUR DUPLICATE PARTS THE HIGH MECHANICAL and corrosion-resisting properties of stainless steel. Do it without a heavy production penalty. Simply set up and run Free-Machining ENDURO Stainless Steel Bars. Two grades are fully 90% as machinable as Bessemer screw stock. These high-quality, cold drawn bars provide close tolerance, accuracy of section, uniform soundness, a fine surface finish. Available in hot-rolled bars as well as cold finished bars and wire.



outboard motors

The combination of engineering know-how and use of only the highest quality materials, including Republic Cold Drawn Alloy Steels, provides the key to the built-in dependability of Johnson Sea-Horse Motors.

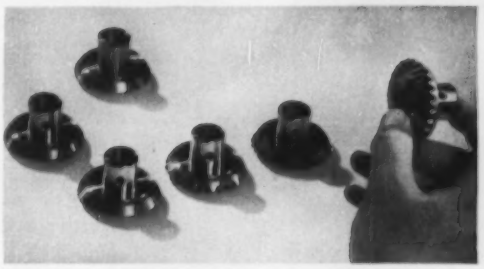
Highly machined parts, such as the connecting rod bearing retainer shown above and the spiral bevel gears that drive the propeller shaft and other parts, are made from Republic Cold Drawn Alloy Steels.

As in many new product developments, certain difficulties were encountered in the initial stages of production. The bearing retainer, considered to be one of the most difficult parts in existence to machine, is a case in point.

During rough broaching, chips welded to the broach and tearing of the metal occurred on bearing pockets. A Republic Field Service Specialist was invited to work on this problem with Johnson Engineers. A solution was worked out through close cooperation and teamwork. The blanked parts were heat-treated to increase Brinell hardness. Broaching improved immediately. Chip adherence was eliminated. Surfaces were much smoother.

Republic supplies Johnson with cold drawn alloy steel bars for better machinability, longer tool life and the fine finish needed for parts on their new line of quiet motors.

You can put these qualities of Republic Cold Drawn Alloy Bars to work in your steel parts—plus high strength, close tolerance, toughness, hardenability, accuracy of section. And Republic metallurgists and machining specialists stand ready to help you uncover the answers to tough cost and production problems, ready to help you get the most out of the Republic Cold Drawn Alloy Bars you buy. The coupon will bring you more information.

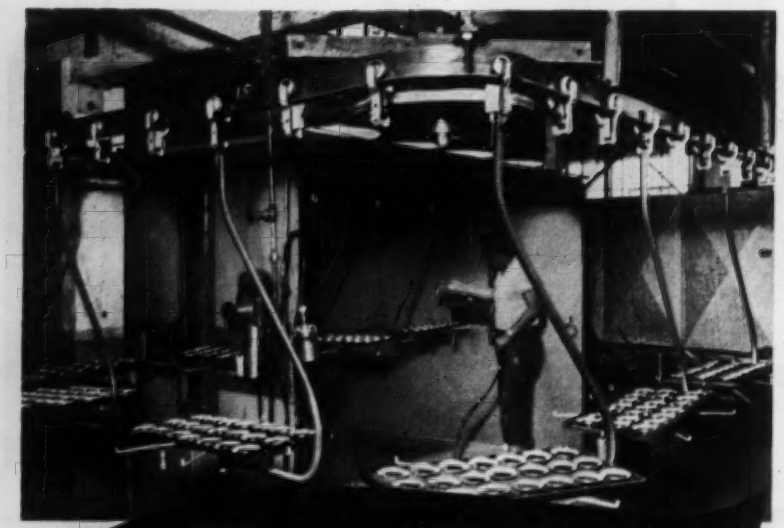


Gear action on Johnson Motors is smooth, positive, quiet. Photo illustrates sequence of machining operations performed on the spiral bevel gears that drive the propeller shaft. Republic Cold Drawn Alloy Steels give these parts added strength and a fine surface finish.

REPUBLIC STEEL

World's Widest Range

of Standard Steels and Steel Products



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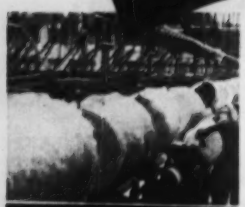
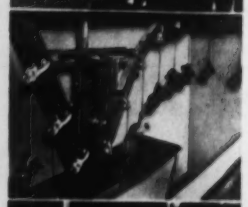
BUSCHMAN
OVERHEAD CABLE
CONVEYORS
give you
GREATER SAVINGS!





LOWER INITIAL COST — Buschman "Universal" Cable Conveyors not only cost less but also outperform heavier, more expensive conveyors for light and medium-weight applications.

LOWEST MAINTENANCE COST — Constant take-up readjustment is eliminated because of a safety factor of 14-to-1 or greater.

LOWEST REARRANGEMENT COST — Exclusive Buschman design plus lightweight all-bolted construction make future changes fast and easy.

MORE COMPACT DESIGN — Shorter radius curves and dips permit more complete utilization of production and storage space . . . both overhead and at work level . . . require less room inside industrial ovens, washers, dip tanks, etc.

SMOOTHER OPERATION — There are no pulsations or jerks to damage delicate parts or finishes when your product is handled on Buschman Cable Conveyors.

PRE-ENGINEERED — Using Buschman standard stocked parts, your own crew can set up a "Universal" Cable Conveyor tailored to your specific requirements.

Write today for catalog.

PRODUCE MORE . . . FOR LESS
Buschman Conveyors
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THE E. W. BUSCHMAN COMPANY
4496 Clifton Avenue • Cincinnati 32, Ohio

Representatives in Principal Cities

Complete Conveyor Systems For All Types of Industries • Engineered • Manufactured • Installed

(*Concluded from page 93*)

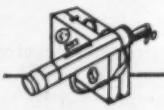
Pa.; Griffin & Griffin, Atlanta. Uptegraff makes electrical transformers.

Master Electric Co., Dayton, O., named Smallcomb Electric Co., Los Angeles, as parts distributor for its line of motors in Southern California.

Ampco Metal Inc.'s Safety Tool Division, Milwaukee, appointed Aviation Service Supply Co. (Kansas City, Mo., and Ogden, Utah) and Amco Corp., Linden, N. J., as distributors in their respective trading areas. Ampco's Resistance Welding Division named General Distributing Co., Great Falls, Mont., distributor in that area.

Noland Co. Inc.'s branch in Spartanburg, S. C., has been named distributor for **Union Asbestos & Rubber Co.'s** air-conditioning products in that area.

Swartwout Co., Cleveland, appointed Whitney M. Kerr Co. as representative for the company's line of ventilation equipment.

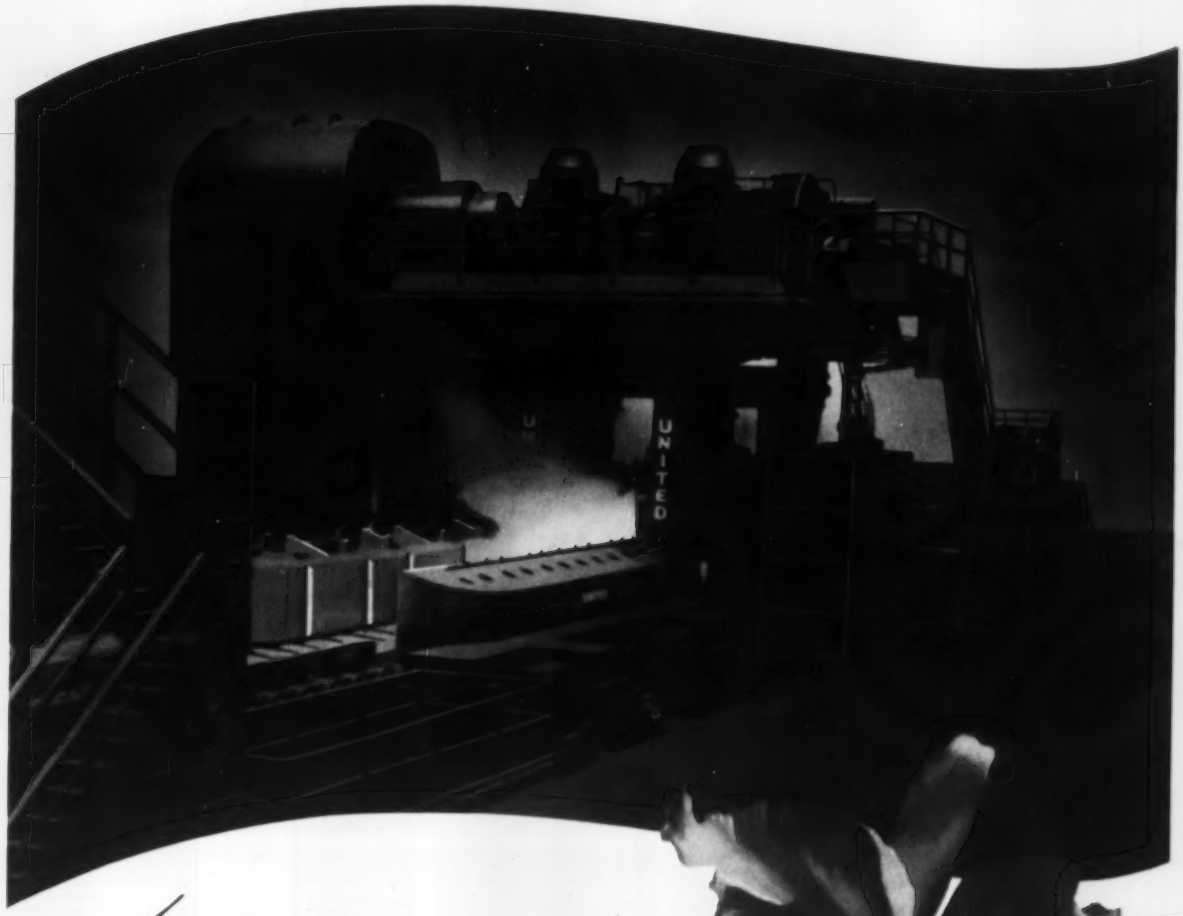


VACATIONS

Chase Brass & Copper Co., Waterbury, Conn., will close its plants for its annual vacation from July 4 to July 18. Included are the Waterbury and Cleveland mills and plants of Waterbury Mfg. Co. and Kennecott Wire & Cable Co. Chase Brass warehouses and sales offices will remain open for emergency shipments from warehouse stocks.

ASSOCIATIONS

Herbert Barchoff, head of Eastern Brass & Copper Co., New York, was elected president of Copper & Brass Warehouse Association, Washington. He succeeds D. M. Hanson, Hubbell Metals Inc., St. Louis. Other officers are H. C. Armstrong, Williams & Co. Inc., Pittsburgh, vice president; Valentine Seeger III, Seeger Brass Co., Toledo, O., treasurer; and Norman Rosow, New York Brass & Copper Co., New York, secretary.



An Orchid to a Champion

45" Reversing Slabbing Mill which has broken all world records by rolling 214,842 net slab tons in one month.

designed and built by

United

ENGINEERING AND FOUNDRY COMPANY

Pittsburgh, Pennsylvania

PLANTS AT PITTSBURGH • VANDERGRIFT • YOUNGSTOWN
CANTON • WILMINGTON (LOBDELL UNITED DIVISION)

SUBSIDIARIES: ADAMSON UNITED COMPANY, AKRON, OHIO
STEDMAN FOUNDRY AND MACHINE CO., INC., AURORA, INDIANA

Designers and Builders of Ferrous and Non-Ferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other heavy machinery. Manufacturers of Iron, Nodular Iron and Steel Castings and Weldments.

Photo shows automatic bolt maker. Courtesy of Oliver Iron & Steel Corporation.

Mr. Tooley Says:

"It takes two to make a bargain"

How right!

In the field of tools and tooling materials for shaping, forming and removal of metal, Firth Sterling occupies the unique position of supplying *both* steels and carbides to do your job. Thus you *are* always assured of a *bargain* . . . the just-right selection from alternative materials, offered *without bias* from a single source of complete shop tooling.

Cold heading operations, for example, illustrate the point. Either steel or carbide, or both, may be used successfully. But one may have an advantage over the other because of the requirements of the job . . . such factors as quantity of product, geometric design, desired finish, material used and tolerances required. We have *both* steel and carbide. We can recommend the exactly right one, or both, if indicated! Yes, for cold heading "it takes two to make a bargain" . . . Firth Sterling C.H.Q. Steel and Firthaloy Carbide Nibs.

C.H.Q. COLD HEADING QUALITY STEEL

- Controlled hardenability by size
- Controlled carbon content by size
- Special cold heading inspection for good centers
- Safety in heat treatment
- Superior toughness and fatigue resistance

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STEEL

May 23, 1955

Technical Outlook

FULL CIRCLE—Titanium powder metallurgy is on its way back as a competitor to presently favored melting and forming techniques, predicts Mr. J. F. Sachse of Metals Disintegrating Co. Inc. He sees roll bonding of improved titanium powders as the answer to profitable titanium scrap recovery.

TWO FOR ALUMINUM—Alloy X2219 (Alcoa), a member of the aluminum-copper group, raises the service ceiling for aluminum aircraft structures to the 500-600° F range. Typical yield strength after 1000 hours at 500° F: 21,000 psi. It's available in experimental quantities.

Kaiser announces 5083 in thicknesses to 2 in. and widths to 90 in. It's a nonheat-treatable alloy designed for high-speed welding with inert-gas shielded arcs. Welds have an ultimate tensile strength of 42,500 psi. Tensile strength of the parent metal in the "0" temper: 44,000 psi.

HOTTER TURBINES—High temperature gas turbines may use the heat produced in atomic furnaces, says Farrington Daniels, University of Wisconsin professor. To make the combination efficient, nuclear reactors used with the turbines will have to be constructed of ceramic materials because of intense heat.

BORIDE TOOLS—ASTE is studying borides for use as cutting tools. Next to diamonds, they are harder than anything else in the cutting field, but they are brittle. ASTE hopes to come up with cemented borides that will hold an edge.

LIGHTWEIGHT CHASSIS—Something new in the automotive world is coming out of Switzerland. It's a tubular steel chassis for use with plastic bodies. Big problem with it up to now: High-strength weld bonds without the warpage or embrittlement common to normal fusion welding. Metal joint inserts were thought to be necessary, but a low-heat process developed by Eutectic Welding Alloys Corp. produces a simple buttweld that is stronger than the reinforced joint.

PLATING ANODES—Aluminum-cored lead anodes for chromium plating are light and have a long life. If the lead cladding is accidentally broken, the exposed aluminum will not harm the plating bath, say the joint developers, Reynolds Metals Co. and Knapp Mills Inc., Wilmington, Del.

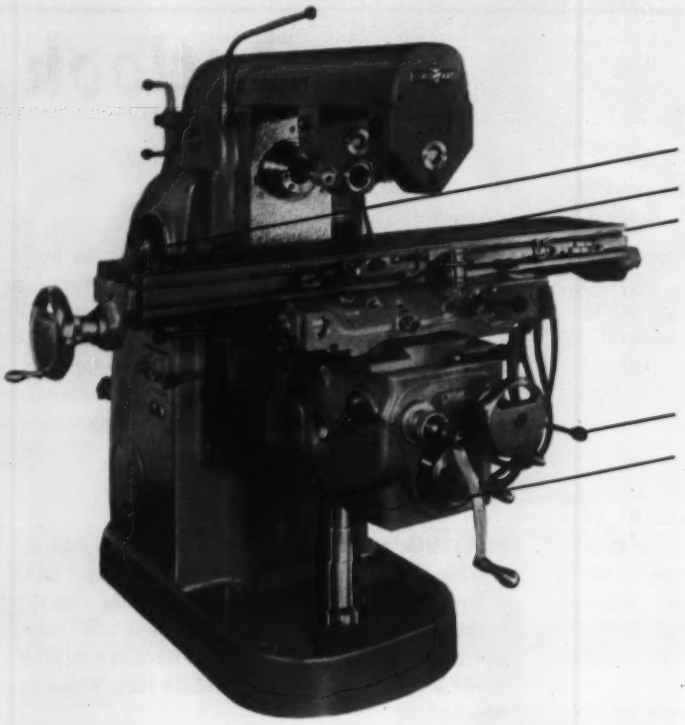
PLATINUM PLUGS—Platinum spark plug electrodes are giving double the service life of nickel-electrode plugs used in most military and commercial aircraft. The AC Spark Plug Division of General Motors developed the idea. The plug has a silver central electrode with a sizable chunk of platinum on its tip. Side electrodes are all platinum.

STEELMAKING FIRST—Chalk up another one at U. S. Steel's Applied Research Laboratory in Pittsburgh. The first mass spectrometer in the industry is probing the atomic structures of coke oven gases. Aim: Closer controls of valuable by-products.

COLD STORAGE—A battery of 52 hydraulic presses for cold extruding 17 types of projectiles has been installed in the Naval Industrial Reserve Ordnance Plant, Pittsburgh. After dies are proved and production routines established, the $20-million project will go on stand-by. Mullins Mfg. Corp. made the installation.

Metalworking Outlook—p. 51 Market Outlook—p. 143

1955



16 speeds (25 to 1500 rpm)

Automatic table cycle available

Table—52¾ x 10 in.

150 in./min. rapid traverse

16 feeds

Wt.—5275 lb.

MILLING

1945

15 speeds (23 to 1200 rpm)

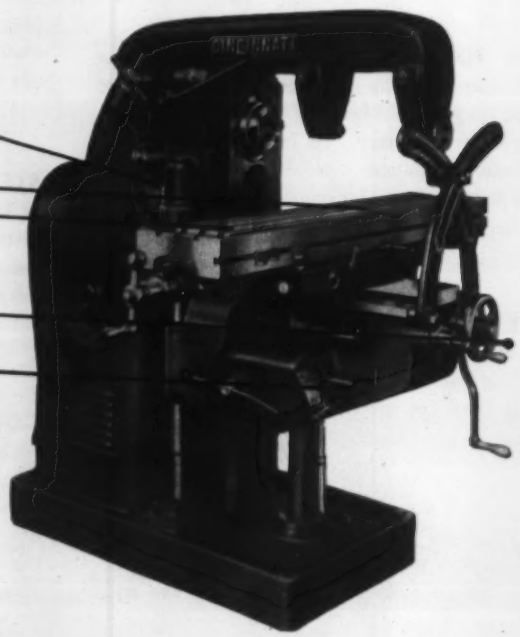
No automatic table cycle available

Table—49 x 10½-in.

100 in./min. rapid traverse

12 feeds

Wt.—4800 lb.



HOW MUCH fundamental change takes place in a machining operation?

"Almost none," is the answer. The principle governing the cutter's attack on the workpiece is basic, is subject only to minor revision as the engineers learn more about it.

All other factors in the machining equation are considered variables. As such, they're subject to constant, and sometimes drastic, improvement.

Goal—Behind all the changes in milling, as in the other machining operations, lies one aim: Better workpieces at lower unit costs. It seems trite to say that, but it ties together a host of seemingly unrelated developments which are affecting all milling.

Controls—The most spectacular development is the automatic control of all the machine's functions.

This is the second in a series of articles on Machining . . . 1955. The first, on turning, appeared in the May 2 issue. Others will be on forming, drilling and boring, planing and grinding.

• Extra copies of this article are available in quantities from one to three until supply is exhausted. Write Editorial Department, STEEL, Penton Bldg., Cleveland 13, O.

Signaled by a prepared tape, the machine goes through its paces, changing feeds and speeds and following intricate contours. The operator acts as an observer and watchman. The human element, subject to error, is removed and waste motion is cut to a minimum.

Similar to these controls, but slightly more limited in extent, are the contouring systems that guide the cutter from a template or from a line drawing. On complex jobs, these, too, eliminate both waste motion and error.

Controls have been modified even on standard milling machines. They're both easier to operate and more precise. Hand levers have been relocated to aid the operator. Many functions, such as speed change, have been made pushbutton operations. The object is to reduce the noncutting time to a practical minimum.

In line with this thinking, standard machines are getting their share of automatic functions. Parts of the cycle, for instance, are being made automatic to permit loading and unloading of workparts while another one is cut.

Power—Chiefly in recognition of the increased potential of carbide tools, horsepower (and thus speed) is on the way up. Motch & Merryweather Machinery Co., Cleveland, will show a new bed-type machine in September. Driven by a 25-hp motor, the same machine had 10 hp ten years ago.

To curtail power loss in driving the table and in the other power functions of the machine, many builders are giving the spindle a motor of its own.

Rigidity—With faster, heavier cutting comes the requirement for a rugged machine. Rigidity adds to the life of the cutting tool, eliminates vibration in the machine and puts a finer finish on the part by eliminating chatter marks.

This rigidity has been added not only to the machine bases and columns but also to bearings, spindles, arms and other parts.

Specials—The apparent answer to high production requirements of users is the special milling machine, designed and geared to the peculiarities of a single job. Here the builder is caught by crossing demands.

The user wants a machine that answers his high production needs on today's job. At the same time, he wants the machine to be sufficiently versatile so he can convert it to a new job at some expected but unknown date.

The builder's answer is the standardized component. Each special machine becomes a specially engineered assembly of standard components. Comes the time to change jobs, a new assembly is engineered, often using the same old components.

Cutters—Much of the improvement in milling can be attributed to the heart of the operation, the cutting tool. In the first place, there is a marked trend toward the use of carbide cutters. One estimate is that 60 per cent of all production milling is done with them.

Carbides make possible faster metal removal rates. At these higher rates, heavier cutter bodies often are used to improve rigidity.

Fluids—Milling is a challenge to the cutting fluids. The big problem is to get the fluid into the cut. The method of application must be right. Directing the stream from behind the cut, under some pressure, seems to be the best answer.

Carbide milling usually is done dry. Since the cutting edge buries itself in the cut, it has a chance to heat up. The coolant acts as a quench—causes the cutting tip to crack and fail.

Tips—One newcomer to milling is the indexable carbide tip. As in turning, the milling indexable is turned through a series of new cutting edges. Some experts think that the disposable carbide wafer (it's also indexable, but is thrown away instead of being reground) also will make the jump from single-point tools to the milling cutter.

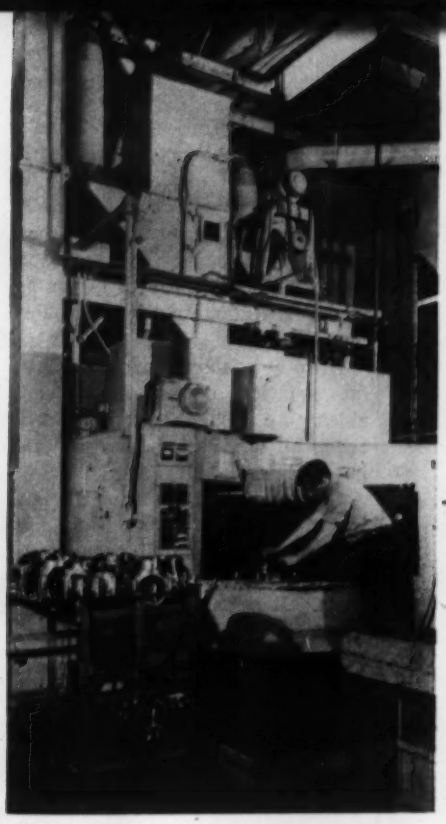
Tool angles have not changed substantially. Carbide rake angles are about as they always have been; clearance angles seem to be increasing. Corner angles also are increasing—45 degrees is becoming standard where it used to be 30 degrees.

Finer Pitch—Many milling cutters are being made with more teeth per inch. One manufacturer, for example, has increased the teeth on a standard cutter for cast iron from 24 to 44. On the same size, 12-in., steel-cutting standard, there are up to 44 teeth instead of the former 18.

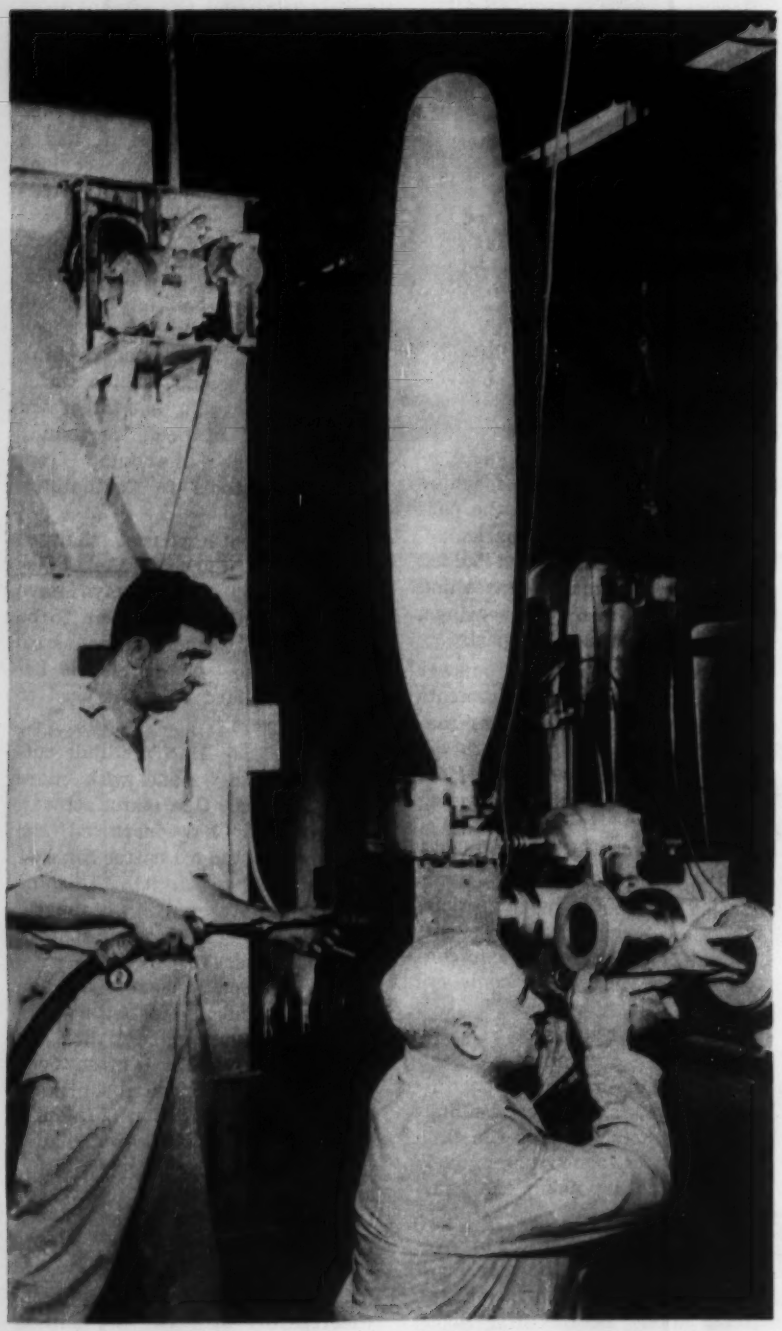
The finer pitch cutters are designed particularly for cuts where loads are likely to be light. As a result they're most often used for light roughing and finishing cuts. One qualification: In milling steel, room between blades must be sufficient for chip clearance. This limits the number of teeth per inch.

With finer pitch cutters, you get a better finish on the workpiece. With twice as many teeth, theoretically at least, the milling feed can be doubled with no change in chip load.

You can improve the fatigue strength of materials at points of greatest stress. An aircraft firm builds safety margins into its propellers by this method



In this machine, hub assemblies are shot peened in less than 2 minutes by an adjustable blast wheel



Shot peening the internal cavity in a propeller blade. Design of the blast nozzle permits a shot impact angle of 90 degrees as the blade revolves

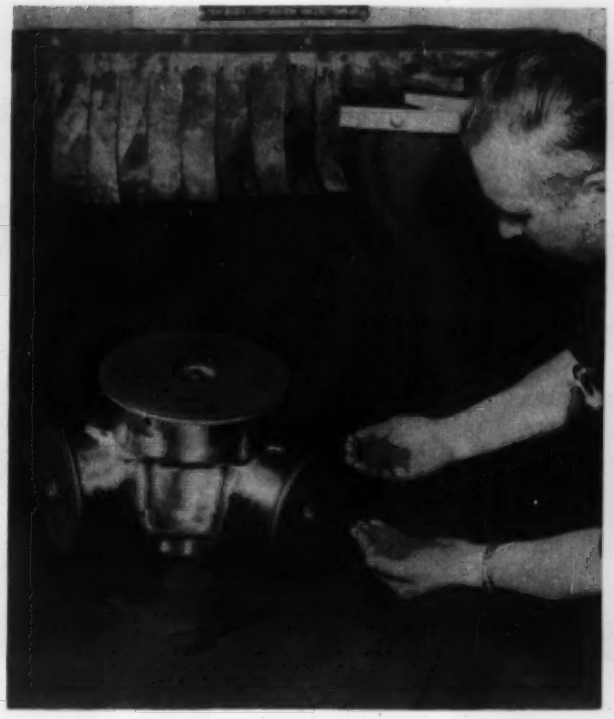
Shot

REPEATED or fluctuating stress in machine elements will cause operational failures. But residual compressive stress in the same surface area, such as is created by shot peening, will strengthen the part.

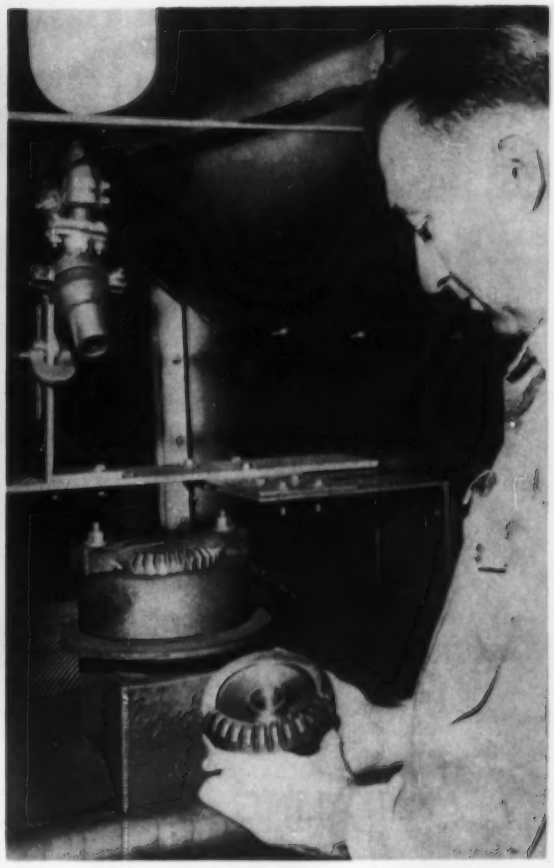
That's why aircraft propellers are shot peened at Hamilton Standard Division, United Aircraft Corp., Windsor Locks, Conn. Strength could be increased by use of additional material, but in the aircraft industry, extra weight is undesirable.

Applying the Theory—Today's aircraft propellers are precision machines. They must be engineered and manufactured with wide safety margins built into every part. Peening improves the fatigue strength of the material at points of greatest stress.

Hamilton Standard produces two kinds of propeller blades. One is a built-up steel blade, the other a forged, one-piece aluminum alloy blade which is subjected to three shot peening operations.



Effective shot peening depends on the use of good, round, uniform pellets of steel shot



Lands and grooves of this gear segment are peened in 3½-minutes in this modified blast cabinet

Peening for Safety

Stress Areas—One of these is the peening of the inboard half of the blade.

Each blade also has an internal cavity or taper bore extending about one-fourth the distance of the blade, starting from the base or inboard end. This cavity is shot peened in two operations. The sidewalls of the cavity are peened mechanically as the blade revolves in a peening machine. Shot blasts the sidewalls at a 90-degree angle. The end of the cavity is hand blasted by a tube nozzle at the same angle.

Hub Assembly—In addition to blades, stress areas of the hub assembly are shot peened. First, areas to be peened are left exposed while other areas are masked. Parts are placed in a machine which uses an adjustable blast wheel that rotates through 45 degrees. This is necessary to maintain the 90-degree-angle impact for effective peening. Bringing this machine into production cut peening time from 15 to less than 2 minutes.

A sidelight on this operation is the development of a new method for masking parts. They are dipped in a liquid, rubber-like plastic solution, which dries quickly, and the plastic is carved away from the areas to be peened. Replacing conventional masking procedures, this process saves Hamilton Standard more than $3000 a month.

Tooth Breakage Stopped—Another machine peens jet engine, pneumatic starter rotors which revolve at speeds up to 45,000 rpm. The rotor teeth used to break easily, but now that rotors are peened at the base of the teeth, they hold fast at speeds in excess of the maximum now used.

Other peening operations include the processing of gear segments, bolt heads and miscellaneous parts. A modified Pangborn airblast cabinet, manually operated, peens bolt heads in 20 seconds. Another modified cabinet, automatically operated, peens the Zerol teeth of segment gears in 3½-minutes.

Shot—Selection of the correct shot is important. Not only must an accurate angle of impact be observed, but good, round, uniform pellets of metallic shot are essential. Allowing the shot to break up into grit and be re-used would defeat the purpose of shot peening. Broken shot weakens rather than strengthens the surface of peened parts.

Consequently, not only Hamilton Standard but U. S. Government specifications require the use of shot with less than ten broken grains per square inch of sample.

Costly to Discard—Until recently, abrasive separators did not screen used shot efficiently enough to meet these specifications. The company's only solution was to use the shot once and discard it—a measure which cost $3000 a week.

However, Pangborn and Hamilton Standard engineers have developed a new abrasive separator which screens abrasive well within requirements. This has resulted in a savings of $50 a propeller.

A new roller-hearth furnace assures uniform high quality electrical steel. Annealing costs are no higher than those of former batch-furnace method

ANNEALING

Control Makes the Difference

By EDWARD J. MORITZ
Vice President & General Manager
Laminations Division, Webster-Chicago Corp.
Chicago

MOTOR and transformer laminations straight from the stamping press have fine grain structures and stresses that restrict magnetic performance.

But if the mill anneal were adjusted for best grain size, magneticwise, stamping would be difficult.

Annealing after stamping is the answer. It eases stresses and lets grain size grow. Better magnetic properties result.

How It's Done—At Webster-Chicago, we formerly batch-annealed laminations for motors and transformers in three gas-fired furnaces. Boxes of laminations were manually charged and removed from the furnaces.

The method was slow. Burning oils and evaporation gave off fumes which created an explosion hazard. Carbon deposits were left on parts, and annealing was not uniform.

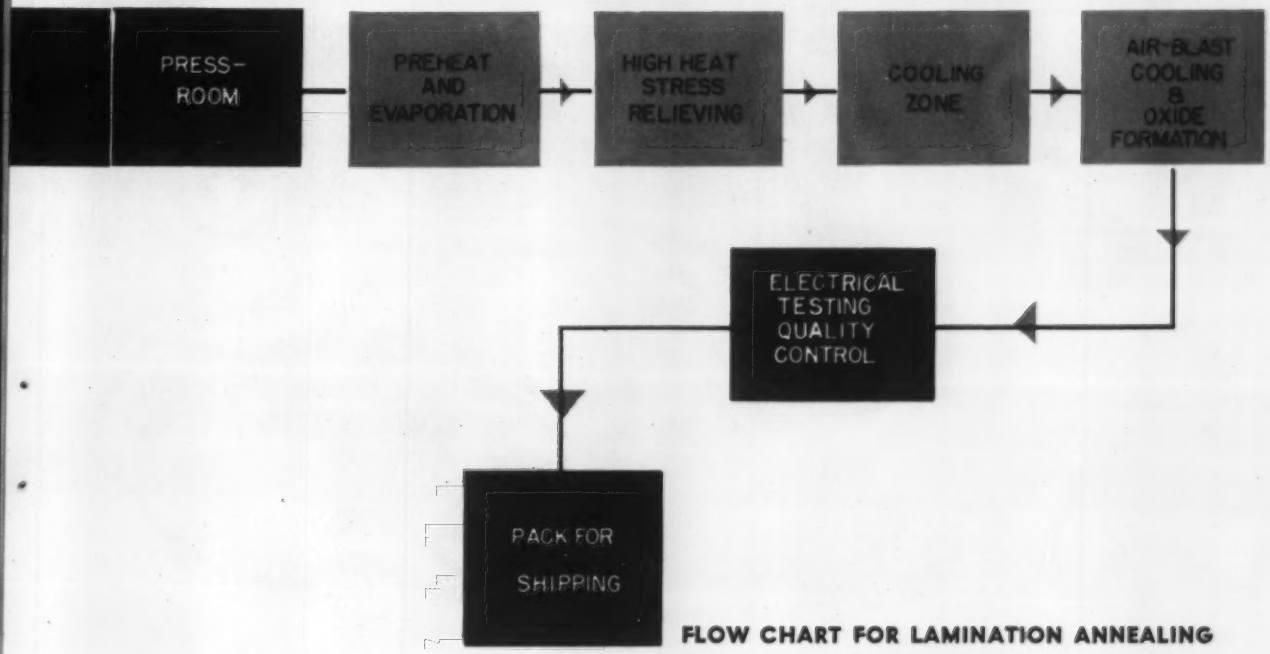
New Equipment—Early this year we installed a new, continuous electric annealing furnace with a capacity of 6500 lb of laminations an hour. All operations are carried on in controlled atmospheres, with accurate heating and cooling cycles. Completely conveyorized, the unit is 105 ft long.

This furnace has improved magnetic qualities and uniformity of our laminations. Annealing costs are no higher than they were. They will be reduced as we gain more experience with the new equipment.

Operation—A power conveyor brings the lamination stampings (in open Incoloy baskets) from the pressroom to the charge end of the furnace. A transfer car loads them on the furnace's roller hearth conveyor.

To avoid a carbon deposit on the laminations, lubricant is removed in a closed preheat and evaporation chamber into which noncombustible, cracked gas is introduced.

This inert gas atmosphere prevents oxidation and acts as a carrier to move the evaporated lubricant to a catalytic cracker. There it is burned and then exhausted outside the plant. Large volume fans agitate the furnace atmos-



FLOW CHART FOR LAMINATION ANNEALING

phere to make an intimate mixture between the carrier gas and the evaporated oils.

Fume Control—Double-door, interlocking vestibules at the charge end of the furnace and between the preheat and high temperature zones prevent the escape of fumes from the preheat chamber into the room or into the adjoining high-temperature zone. These doors operate automatically; no two doors may be opened simultaneously.

Even with the interlocking vestibule, we found it advisable to carry a slightly higher atmospheric pressure in the high-temperature zone than in the preheat zone (approximately 0.06 in. as against 0.04 in.). This induces a counterflow of the atmosphere gases toward the charge end.

Time Control—In the high-temperature zone, sufficient time is allowed to bring the work to the annealing temperature and to provide a 1-hour soak.

Beyond the high-temperature zone, a brick-lined vestibule provides a slow cool in the upper temperature ranges. Next is a sectional water-jacketed cooling chamber. Each zone is individually controlled, permitting accurate control of the cooling rates during the cooling cycle prior to controlled oxide formation.

Water Control—To conserve water and avoid overloading the sewers (the water-cooled section uses 120 gpm), hot water is drawn off to an evaporating cooler and recirculated. Re-use of the water also permits the addition of anti-corrosive agents to protect the cooling jackets.

To prevent oxidation during heating and cooling, externally generated gas is introduced into both the high-temperature and cooling zones. This gas can be controlled to provide either a noncarburizing atmosphere or a decarburizing atmosphere.

Thus it not only is possible to prevent the formation of carbon that would impair the electrical characteristics of the original steel, but also to remove some carbon to improve the magnetic permeability of the laminations.

Oxide Control — Oxide must be formed on the surface of the laminations to provide insulation between them when they are assembled into motor or transformer cores. Oxide is produced in the final forced-convection cooling zone by drawing air upward through the trays.

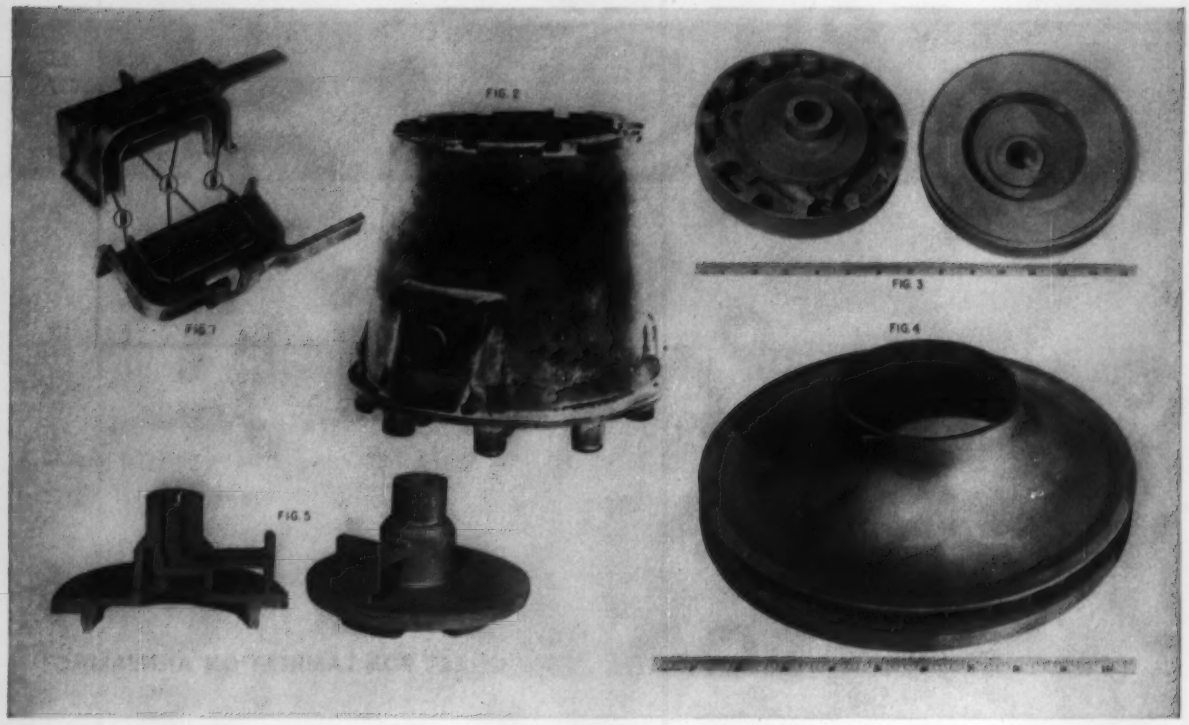
By limiting oxidation to one point in the cycle, the amount of oxide can be controlled by varying the temperature and degree of forced convection. In our earlier methods, little control over oxide formation was possible.

Easier Handling—The close control made possible by the new annealing equipment permits us to handle laminations in conventional strings without sticking between pieces. This makes it practical to use automatic stacking machines to assemble the laminations, cutting assembly time and costs.

The conveyor system that carries the trays of laminations from the pressroom to the furnace and through the annealing cycle is continued at the discharge end of the furnace. Here a system of distributing conveyors takes over.

Quality Control — It is at this point that we take samples from each lot for laboratory quality control tests, both physical and electrical. When released by quality control, trays are carried by one of several gravity roller conveyors to packing benches.

Our furnace was built by Sunbeam Corp., Chicago. The complete installation includes the furnace, conveyor system, generator for the controlled atmosphere, water cooler and a gasoline-powered, stand-by drive motor.



Frozen Mercury Castings Grow

Ability to design strictly for the function without high-cost production processes is the big stimulus. Castings get bigger, more intricate

FROZEN MERCURY precision casting lets the designer create completely from the functional point of view, unhampered by manufacturing problems. That's what Dr. Irvin R. Kramer, vice president, Mercast Corp., New York, told the American Society of Tool Engineers.

"Maximum benefits which can be derived from the use of frozen mercury processes start at the design stage of the casting," he emphasized. That's why knowledge of what is being done with the process must be disseminated, he added.

Some Applications — The wave guide for airborne electronic equipment in Fig. 1 was produced by Alloy Precision Castings Co., Cleveland. It serves as a structural unit and wave guide; interior surfaces had to have a 63 microinch finish. The iris (b) had to be sharp and free of edge roughness.

If size is your problem, check the casting in Fig. 2. It is 15 in. high, 12 in. in diameter and has a wall thickness of 0.100 in., plus or minus 0.002 in. The projecting bosses are put in position by "booking" . . . taking advantage of mercury's self-welding characteristics to build up complex shapes.

Not So Obvious—Even when an easily machinable alloy is used, frozen mercury process castings prove to be economical. The piece in Fig. 3 would appear to be simple to produce by any of several techniques. However, the fuel pump casting contains three pair of venturi-curved, fluid-metering jets exactly 120 degrees apart. To machine them would be costly.

Introduction of alloys with high strength and oxidation resistance has brought fabrication problems. The part shown in Fig. 4 is a heat diffuser made of Hastelloy B alloy, a metal that meets metallurgical specifications but is difficult to machine and more difficult to weld.

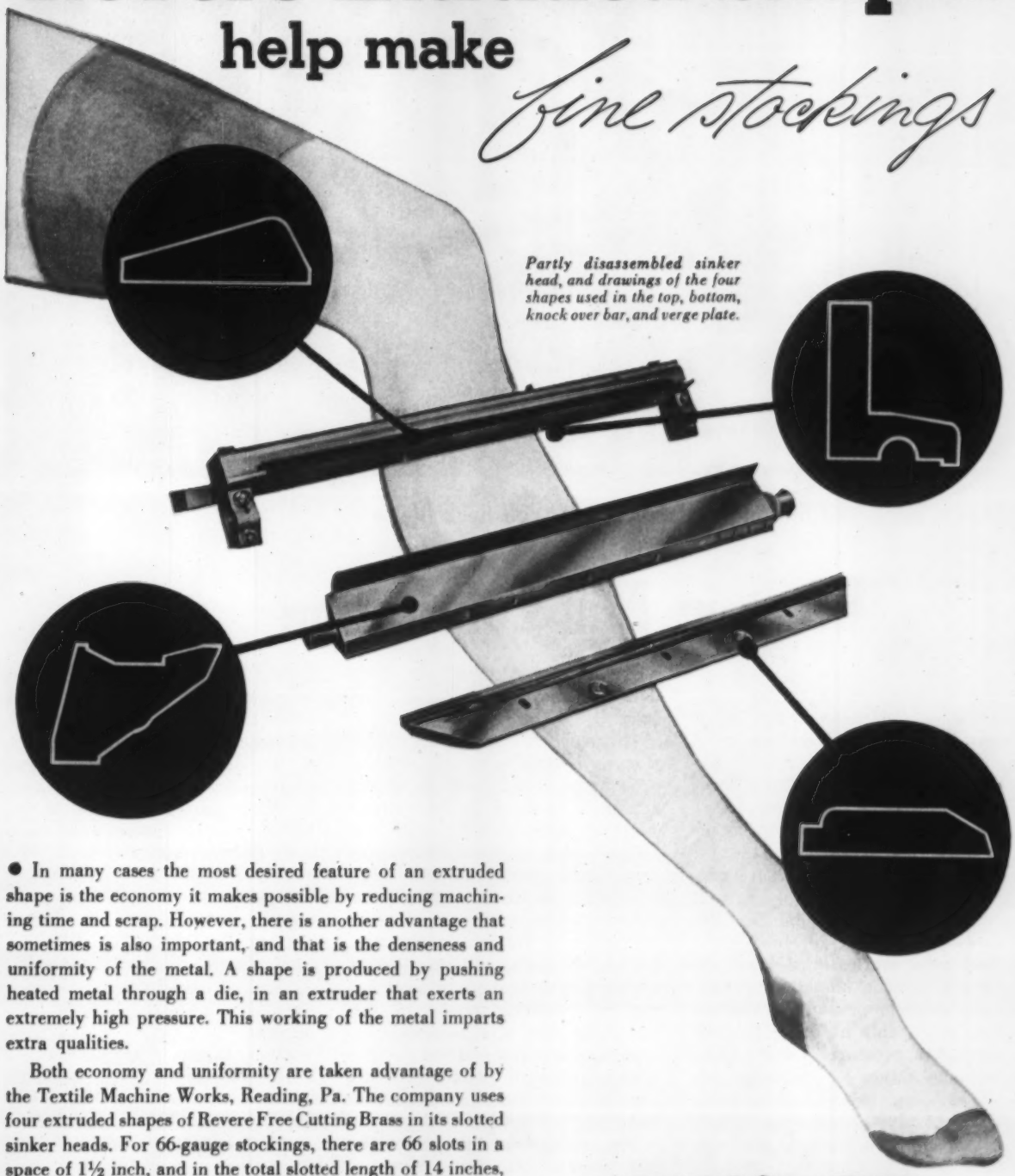
Vanes and ports had to be uniformly spaced, smooth and accurately contoured. The 10-in. diameter placed the part outside the normal realm of the lost-wax technique, while requirements for surface smoothness prohibited the use of sand castings.

Compactness—The compact radar part in Fig. 5 has a fairly complex internal core which must be held to dimensions within plus or minus 0.003 in. It serves as a structural part, holding the rotating part of the antenna system, as well as a wave guide.

Formerly, the part was electroformed, since the core is too complex to be machined or economically cast with wax or plastic patterns. But even the electroformed part proved unsatisfactory. Because of structural weakness, it would not support loads imposed upon it.

Revere Extruded Shapes

help make *fine stockings*



Partly disassembled sinker head, and drawings of the four shapes used in the top, bottom, knock over bar, and verge plate.

● In many cases the most desired feature of an extruded shape is the economy it makes possible by reducing machining time and scrap. However, there is another advantage that sometimes is also important, and that is the denseness and uniformity of the metal. A shape is produced by pushing heated metal through a die, in an extruder that exerts an extremely high pressure. This working of the metal imparts extra qualities.

Both economy and uniformity are taken advantage of by the Textile Machine Works, Reading, Pa. The company uses four extruded shapes of Revere Free Cutting Brass in its slotted sinker heads. For 66-gauge stockings, there are 66 slots in a space of 1½ inch, and in the total slotted length of 14 inches, the tolerance is less than .001 inch. In order to achieve this accuracy, and be assured of straightness and flatness, Textile specifies shapes of extreme uniformity.

Perhaps your requirements are not quite so high as Textile's. Or perhaps they are higher. In either case, we shall be glad to explain how Revere Extruded Shapes can save you money, and at the same time help you maintain the highest quality standards. See the nearest Revere Sales Office.

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Latest in Mill Lubrication

THE LATEST thing in the lubrication of roll necks is the spray application of grease and oil. Here are some of the facts. H. C. Inlow, research chemist, Cities Service Research & Development Co., East Chicago, Ind., revealed them at the spring conference of the Association of Iron & Steel Engineers, Detroit.

General requirements for the spray application of lubricants: They must lubricate, be water resistant, provide an adhesive film, have extreme pressure properties and be capable of being pumped through a pressure system. They find application on blooming, billet, slabbing, bar and plate mills. Bearings may be fabric, bronze, babbitt or combination and segmented.

Pneumatic Principle—The lubricant is introduced into pneumatic atomizing nozzles mounted on a manifold a few inches from the neck surface. The pumping cycle is not continuous. A frequent supply of lubricant to the neck is essential since the wiping action of the bearing and water washing tend to remove the film of lubricant.

The chief reason for installing a spray system is to properly lubricate the thrust surfaces of the roll neck. Use of spray application eliminates the need for grooved ports in the high-pressure zone. The bearing surface available under maximum rolling pressures is increased. Longer bearing and neck life can be expected.

Graphite seems to help the thin grease film on bearing surfaces resist the washing action of the water; it also acts somewhat as a parting material and reduces the tendency toward galling of bearing surfaces under conditions of boundary lubrication.

The number of lubricants for mill operation can be reduced because roll neck lubes can be used for screwdown screws and nuts, housing windows, table bearings and spindle carrier bearings. Roll neck spray oil also can be used for pinion stand lubrication, enclosed vertical gear sets, etc.

In discussing "Composition Bearings Used in Rolling Mills," K. E. McHenry, assistant superintendent, mechanical department, Bethlehem Steel Co., Lackawanna, N. Y., pointed out: This type bearing is successful for loads up to 6000 psi; above this value, higher friction losses and cold flow of the laminate limit efficiency.

Conductivity is one of the most important factors in composition bearing design. The accumulation of heat in the journal is rapid and can reach the charring temperature of the laminated plastic quickly.

When operating at low rubbing speeds (200 fpm), grease or lubrication should be used with water for cooling. At high speeds, water lubrication usually is sufficient and generally offers lowest friction losses, which often mean considerable savings in power needed to drive mills converted from metallic-type bearings.

Surface Is Protected—Roll necks should be smooth and swabbed or sprayed with mineral oil during shutdowns to prevent the formation of rust on the necks (and

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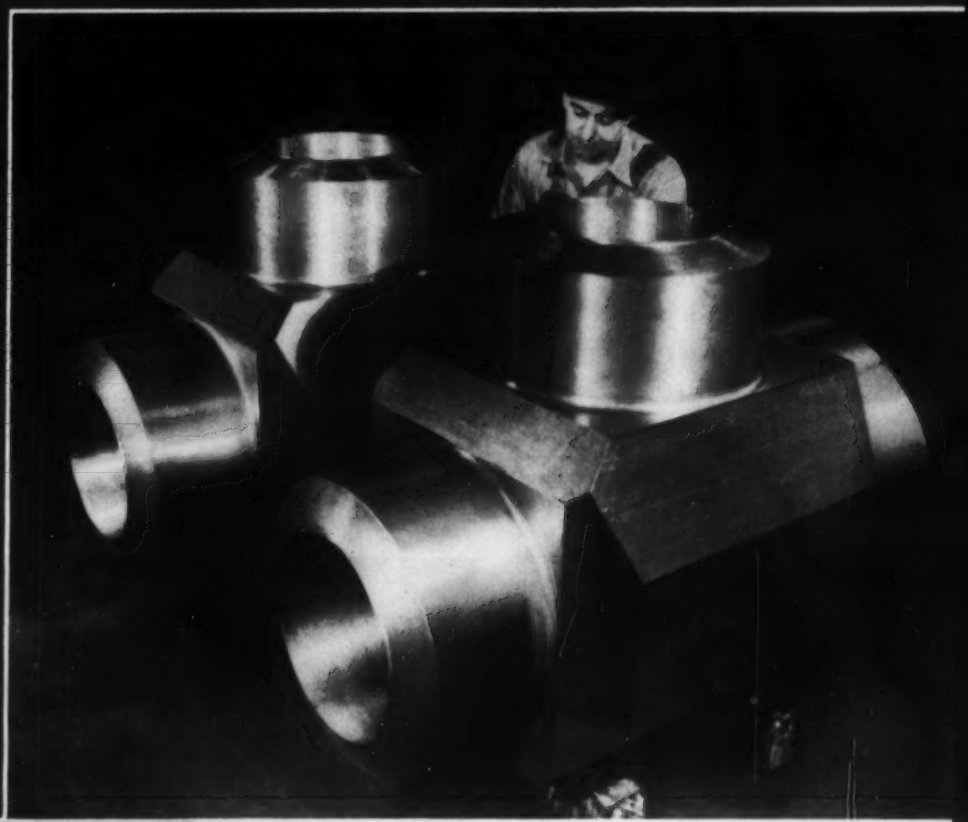

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MESTA MACHINE COMPANY

PITTSBURGH, PENNSYLVANIA

minimize the rate of bearing wear). Some mills have automatic spray units which inject mulsified oil solution on the necks at shutdown and also before starting up.

Water should not exceed 135°F for a steel mill, roll neck bearing device. Above this temperature the viscosity of water is low. Unless loads are light, contact between journal and bearing will be made, and a hot spot may cause delamination of the fabric. A good rule to remember: In lubricating composition bearings apply water so it stays on the exposed surface of the journal as long as possible.

On reversing mills where grease is introduced on a composition bearing to reduce high starting torque, a heavily chamfered hole outside the load zone has proved effective as a means of entry. This forms a lubricant reservoir from which the grease spreads through the bearing area. Either soluble or nonsoluble greases are being used for these high-pressure, slow-speed applications of such specification that the film will resist rupture even under maximum loads.

Important—In converting a mill to fabric bearings have a separate system of water supply lines so water may be shut off the mill rolls, guides and passes while the mill is rolling. Water going to bearings is not interrupted. This will extend bearing life greatly.

Properly applied, composition bearings reduce mill delays by giving longer service life and predictable wear life. They lower power consumption—usually 20 to 25 per cent, sometimes as high as 50 per cent. There is less frictional loss at the journals. They improve the accuracy of sections on many mills, particularly bar mills. Their resiliency and resistance to wear require less adjustment to keep sections on these mills.

New Mill Drive—A combination of differential mechanical gearing and variable-speed hydraulic units has been under exhaustive field tests for two years. A. L. Thurman, executive vice president, Mannesmann-Meer Engineering & Construction Co. Inc., Easton, Pa., explained the system in a paper, "A New Approach to Continuous Mill Drives." Coauthor was D. Hancke, Maschinenfabrik Meer A.G., M.-Gladbach, Germany.

The new drive is applicable to continuous tube and pipe mills, hot and cold-strip mills, merchant and rod mills.

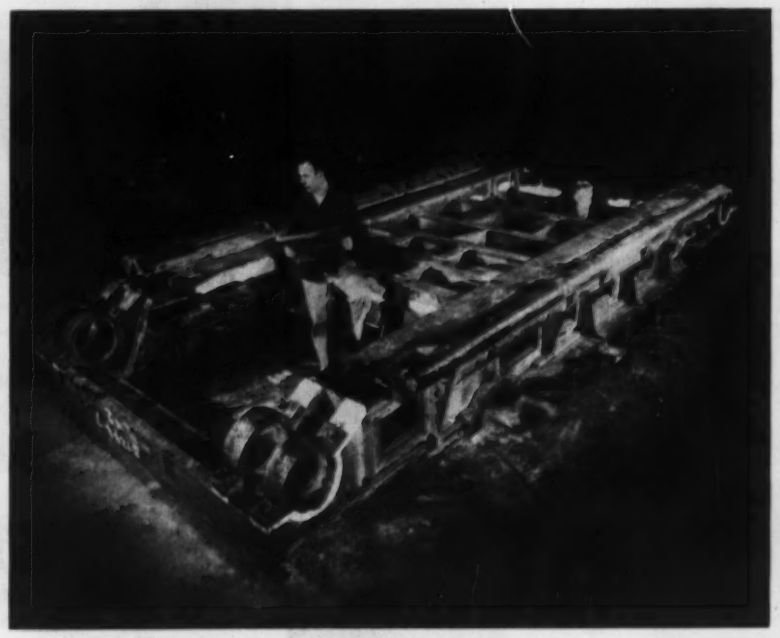
Lower Horsepower — Owing to the drive arrangement and the resulting load distribution, the total installed horsepower for any given mill is substantially less than it would be when using individual direct-current motor drives. Outstanding rigid speed ratio is maintained at the preselected speed of each stand under heavy shock loads and frequently changing load conditions.

In addition, it also is possible to make a group speed co-adjustment under load. Any preset schedule may be used by proper control of the speed adjusting units. Lower inertia of the parts to be accelerated or decelerated allows for more rapid governing to suit changing load distribution and conditions of varying speed and/or tension.

Roll Grinding — William Pope, direct factory representative, National Grinding Wheel Co., North Tonawanda, N. Y., said this about roll grinding: Hot-strip-mill backup rolls usually are ground with a 24 to 40-grain, aluminum oxide, resinoid bonded wheel. Rolls must be ground accurately and checked for straightness and out of roundness to avoid rolling trouble.

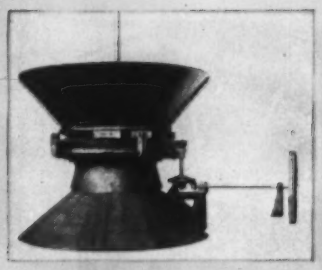
For the average run of cast steel work rolls, the finish produced with 80 to 150-grain wheels is considered satisfactory. Generally speaking, resinoid and shellac bonded wheels are preferred in grinding cold mill rolls. Forged steel, tandem mill work rolls usually are ground with 80-grain, aluminum oxide, resinoid bonded wheels. However, 80, 120 and 150-grain, shellac bonded wheels are being used to good advantage on temper and skin mill work rolls and on tandem mill finishing rolls.

The average grinder operator prefers a good shellac bonded wheel because it stays sharp and free cutting, produces the desired finish in less time and effort, is easier to work and does not produce chatter so readily as a resin bonded wheel.

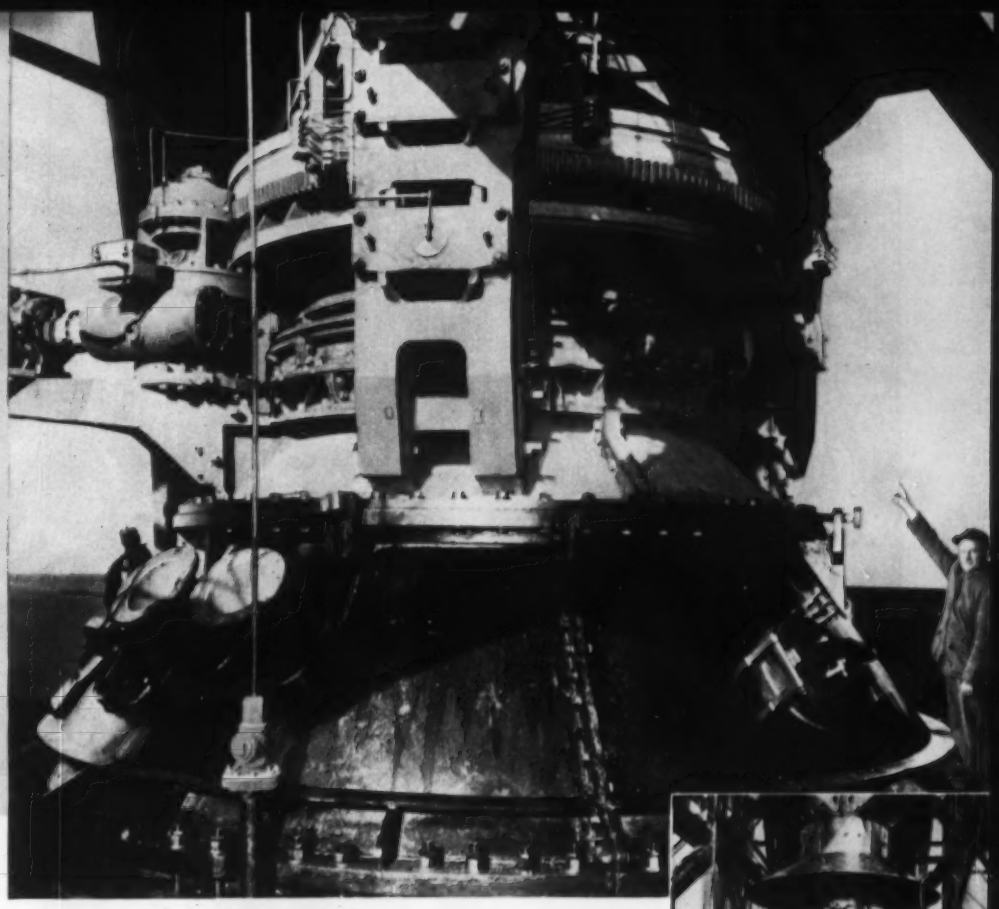


New Trolleys Are Same Size But Much Stronger

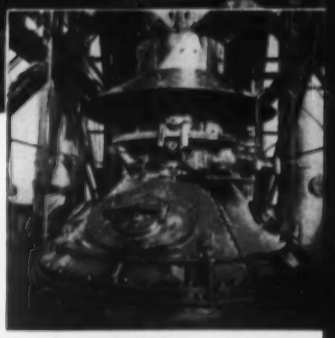
Four new trolleys for the 250-ton ladle cranes at U.S. Steel Corp.'s Edgar Thomson works, Braddock, Pa. have 85/15-ton ratings instead of 50/15. They operate on the existing bridges with the same clearances, thanks to T-1 high-strength steel in the box girders and stiffener plates. Corporation engineers believe many cranes could be uprated this way



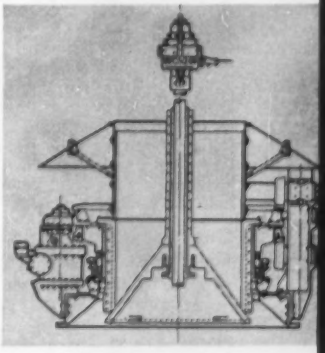
"BABY PICTURE." This photo was made in 1906 when the McKee Distributor was only one year old.



1955 MODEL. McKee Heavy-Duty Distributor for largest Blast Furnaces.



STANDARD MODEL. This is the McKee Distributor that has been virtually standard equipment throughout the industry for half a century.



ON THE WAY. McKee is developing a new distributor, for smaller, existing furnaces, which will incorporate all the best features of the heavy-duty model.

Portrait of the
McKee Blast-Furnace Distributor
on its 50th Birthday . . .

Many changes and improvements have been made in the McKee Blast-Furnace Distributor since 1905, but one thing about it has never changed —that is its universal acceptance as the standard of the industry.

In the course of fifty years of designing and building all types of plants and facilities for the production of iron and steel, 446 McKee Distributors have been installed in blast furnaces throughout the world.

The high quality of engineering and construction, which has kept McKee Distributors literally "on the top" in blast furnaces for half a century, has also earned for the McKee organization a position of unquestioned leadership in engineering and construction of blast furnaces, open-hearth shops, rolling mills and facilities for the preparation of raw materials.

50th ANNIVERSARY

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Arthur G. McKee & Company • Engineers and Contractors

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British Representatives of Metals Division: Head, Wrightson & Co., Limited
Canada: Arthur G. McKee & Company of Canada, Ltd., 350 Bay St., Toronto

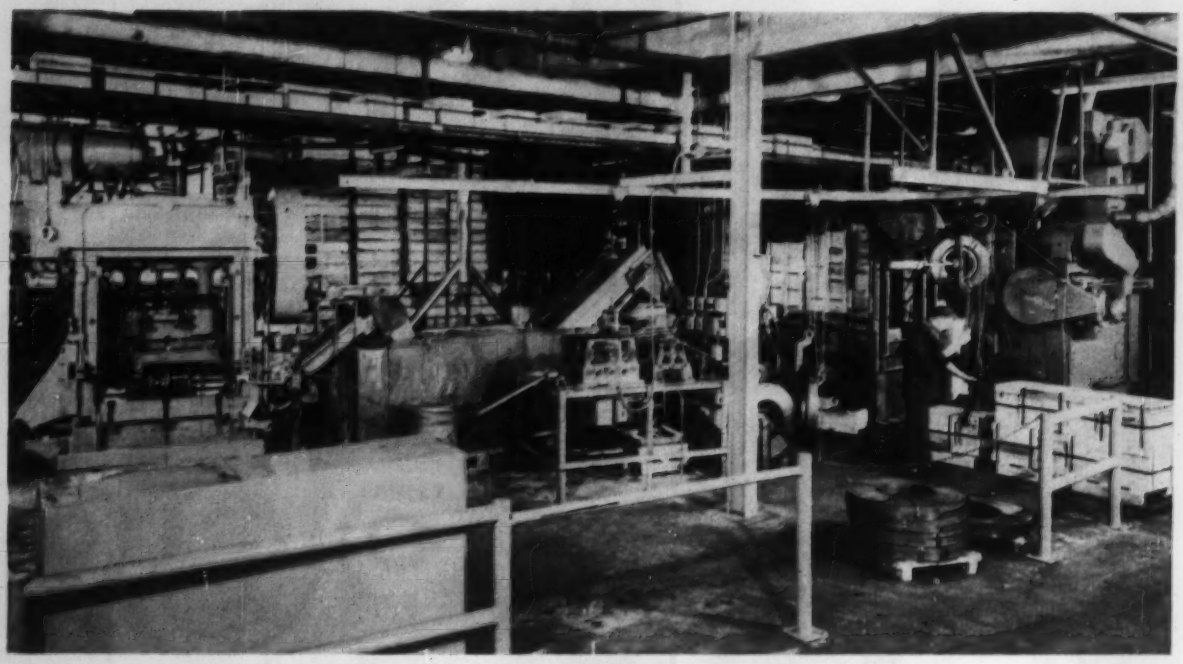
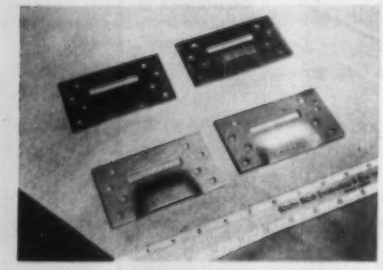


Plate line: (left to right) punch press, first conveyor, de-oiling tank, second conveyor, drying conveyor, accumulator pan and shot blaster with loader

The Next Thing to Complete Automation



One type stamping produced on the line. Two in rear are as stamped; two in front have been shot blasted

ONE MAN operates a complete manufacturing line at Signode Steel Strapping Co., Chicago.

His line produces six stamped steel plates which are used by shippers to secure steel strapping to walls and floors of freight cars. Operations include stamping, counting, de-oiling, blast cleaning and packaging. Production: Five thousand plates every hour.

Procedure—Coiled strip, 6 in. x ⅛-in., passes through an automatic, 100-ton, Bliss press for blanking and forming. Formed plates drop on a conveyor that carries them to a de-oiling tank. The detergent solution in the tank is mechanically agitated and kept near boiling point by thermostatically controlled gas burners.

A second conveyor carries out the washed pieces. Their own heat dries them on a third conveyor, a horizontal chain belt. Then they drop into an accumulator pan.

Finishing — Next step is shot blasting in an American Wheelabrator tumble-blast unit. This removes burrs on edges and around holes and gives parts a satin-matte finish.

Five stampings are blasted in loads of 500 pieces, the other in loads of 1000. All loads are counted by a mechanism on the punch press, which stops it after each group of 500 pieces. Conveyors keep moving, and a timer on the accumulator pan follows through to keep quantities separate, once they are counted. The pan, at the right time, drops each set of 500 plates into a bucket loader for the shot blaster. The operator controls the loader electrically.

Automatic — Blasting, like the rest of the operation, is automatic. No attention is needed once the machine is loaded. Four minutes of blast with steel shot takes care of the deburring.

The operator presses a button and the machine unloads itself into a shipping box. While one lot of stampings is being blasted, the operator has time to put a cover on the previously filled box and strap it shut. A loaded box comes off the line every 6 minutes.

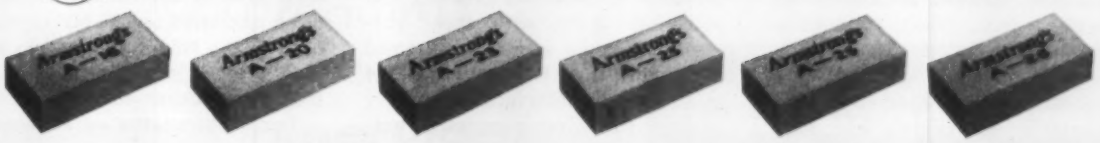
Uniformity....

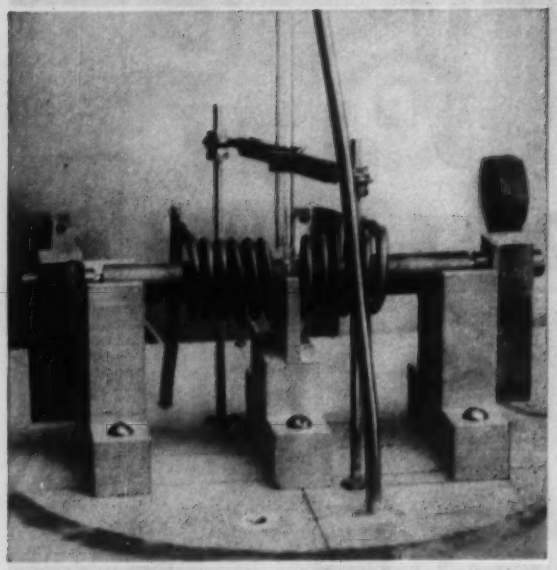
accurate sizes speed dip joint construction with Armstrong Insulating Fire Brick

Armstrong Insulating Fire Brick are made slightly oversize and then machined to size at the factory with a maximum allowable tolerance of 1/32". Result—uniform brick that make thin dip or trowelled joint construction fast and neat and assure heat-tight joints if brick are laid up dry.

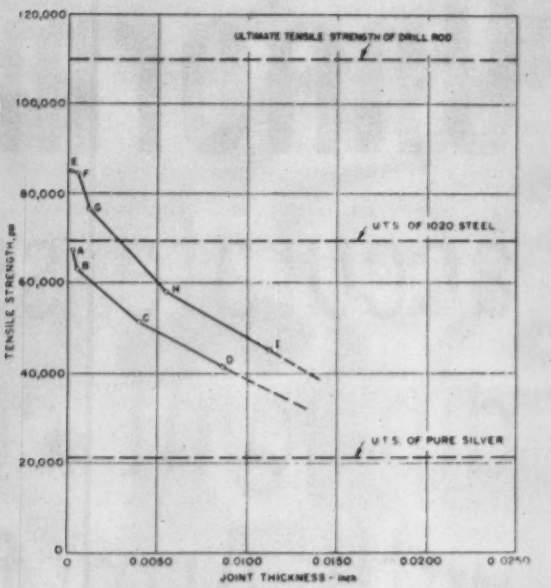
Get free new booklet giving complete information on Armstrong Insulating Refractories. Write Armstrong Cork Company, 2706 Reed Ave., Lancaster, Pa. The next time you need information on an insulating problem, you'll find your Armstrong engineer's knowledge of refractories a big help.

Armstrong INSULATING REFRACTORIES





Close-up of the experimental setup for making thin butt-brazed joints. Bell jar has been removed



Tensile-strength, joint-thickness curve of pure silver joints. ABCD is 1020 steel, EFGHI is drill rod

High-Strength, Butt-Brazed Joints

This technique gives pure silver filler metal a tensile of 84,000 psi before failing. Finely machined surfaces and an ultrathin joint do the trick

By ORVILLE T. BARNETT and NIKOLAJS BREDZS
Armour Research Foundation
Illinois Institute of Technology
Chicago

TESTS conducted at Armour Research Foundation, Chicago, prove that butt-brazed joints with silver filler metal can develop ultimate strengths four times those of the brazing material under certain conditions. Use of this information by designers and welding engineers could open new production horizons for the brazing art.

Working from the principle of adherence between metals by adsorption (e.g., finely machined gage blocks), it was desirable to avoid all base-metal, filler-metal combinations that give rise to intermetallic compounds. After searching through the binary system diagrams, plain carbon steel and fine silver filler metal were chosen.

Preparation — Because surfaces must be oxide-free, a commercial, 10-per-cent hydrogen, 90-per-cent nitrogen reducing atmosphere was prescribed instead of a flux. Since the study ultimately led to extremely thin joints, surfaces were prepared by precision grinding and polishing. Even with these precautions, oxides sometimes formed during heating. Low strength and failure at the interface resulted.

When the silver completely wetted the iron surface and the joint was sound, failure always occurred along the plane of symmetry. The interface, free of diffusion and intermetallic compounds, forms an adhesion bond that is stronger than the filler metal.

In this experimental work, it was observed that joints with a small number of voids in the filler metal —not exceeding 10 per cent of the total area of the brazed surface— often exhibited tensile strengths as high as the voidless joints. In general, thinner joints were more gas free than thicker ones.

Tensile Strengths — Base-metal

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ROSS Aftercoolers serve these I-R Compressors

On the job, but out of sight, in this Ingersoll-Rand air compressor installation at the Reynolds Metals Company Aluminum Reduction Plant, Gregory, Texas, are three Ross Aftercoolers . . . one for each of the 6SVG gas engine driven units supplying plant air.

In dozens upon dozens of other Ingersoll-Rand compressor installations . . . not only in industrial plants, but in numerous chemical plants, refineries and pipeline stations . . . you'll find the same team. Ross Aftercoolers are frequently the choice to work with I-R Compressors . . . just as they are the choice of other highly rated compressor manufacturers.

There are many solid reasons. Among them: (1) *Ruggedness*—the ability to "take-it" under all conditions. (2) *Thermal Efficiency*—unsurpassed by any other heat exchanger design. (3) *Standardization*—assuring prompt availability and economical manufacture. (4) *Engineering Cooperation*—Kewanee-Ross representatives have a reputation for helpful consultation and practical recommendations.

The design and structural advantages of Ross Aftercoolers, Cylinder Mounted Intercoolers, and Lube Oil Coolers have won the preference of compressor builders and users everywhere. Descriptive literature will be mailed to you, so that *you* can evaluate these advantages for yourself. Write.

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INTERCOOLERS

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strength contributes greatly to joint strength. SAE 1020 steel with a tensile strength of 69,000 psi and drill rod with a tensile of 109,500 psi spell out this contribution. In a thin joint (0.00014 in.), pure silver attains a maximum tensile of 67,000 psi; with drill steel, a maximum of 84,350 psi.

Such joint thicknesses can be produced consistently, and filler metals other than pure silver have resulted in joints of no measurable thickness even under the microscope. Copper joints have either matched or exceeded the strength of 1020 steel, and drill rod has failed before the copper filler metal in other tests.

How Come?—Plastic restraint is the answer. When a long column of brazing filler metal between two strong drill rod bars is subjected to tensile stress, elongation causes the filler metal to neck down and fail in the customary manner.

But when extremely thin silver joints are established between the drill rods, tensile elongation during the testing does not produce the same result. There is not enough metal thickness to neck down normally, so the braze metal hangs on tenaciously until the steel begins to yield. At this point, because the filler metal is stressed several times beyond its own strength, it fails suddenly and always along the plane of symmetry.

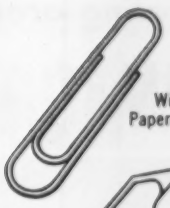
Quick Roundup—To date, several conclusions regarding the strength of butt-brazed joints have been reached:

1. Increase in joint tensile strength by decreasing joint thicknesses is due almost exclusively to the suppression of the necking which occurs during stressing.

2. Stronger base metals develop stronger joints. It is possible to increase joint strength to levels beyond anything achieved thus far.

3. At all strength levels, the steel-braze metal interface was stronger than the braze metal itself. The bond might well be described as an adhesion to distinguish it from the diffusion or intermetallic compound bonds.

4. Butt-brazed joints of excellent strength and uniformity can be produced consistently. These should provide the designer with even more freedom of fabrication.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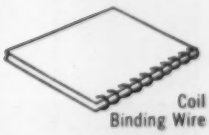
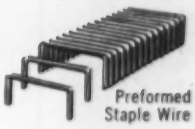

Coil Binding Wire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Operating around the clock on rugged application . . .

NEW G-E DC BRAKE REQUIRES ONLY

G-E DIRECT-CURRENT BRAKE installed on slab depiler at Jones & Laughlin. Brake has required no maintenance in first eight months of rugged duty. All settings and connections are made at one end of the brake.

GENERAL ELECTRIC

ONE ADJUSTMENT IN EIGHT MONTHS

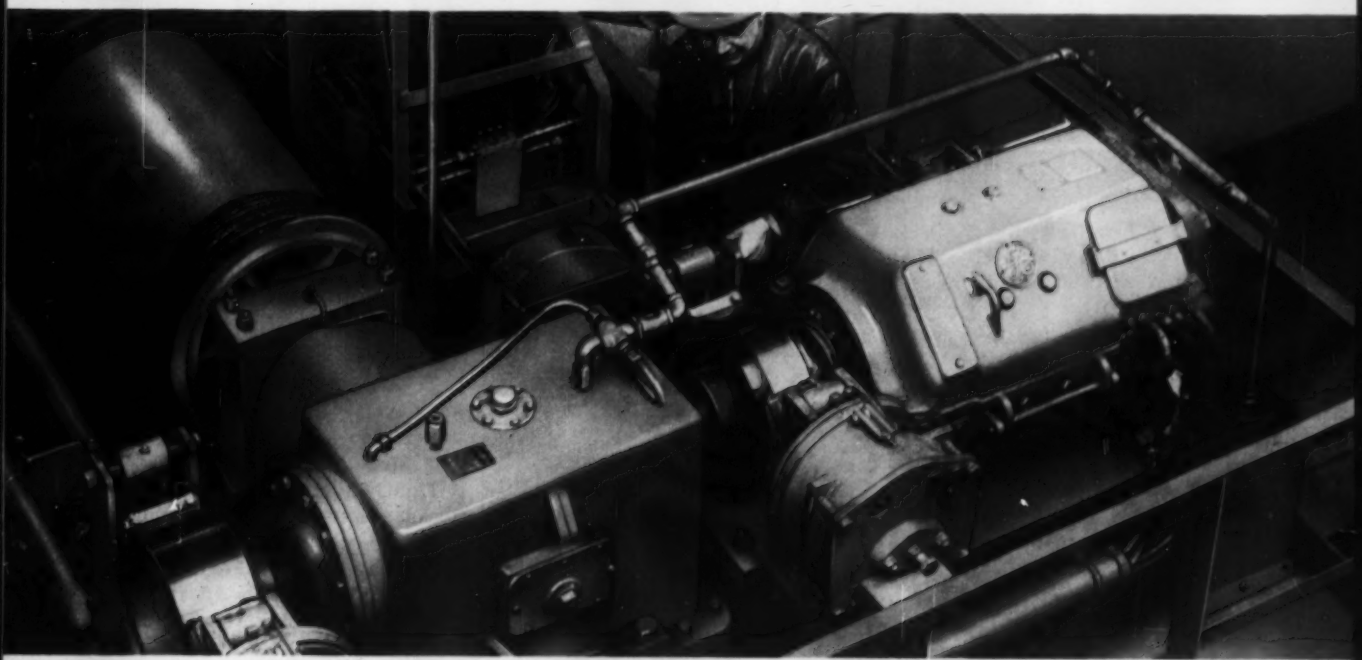
Normal compensation for lining wear at half-million operations only maintenance needed

In its first eight months of operation, a new General Electric direct-current brake has functioned with no faults and has required no maintenance or parts at Jones & Laughlin Steel Corporation, Cleveland Works Division. Only the recommended, normal adjustment for lining wear was made after half-million mark was reached. The brake is in use 24 hours a day on a slab depiling operation vital for continuous steel processing in the hot strip mill area of the plant.

Well satisfied with the brake's excellent performance, J&L specified three more General Electric DC brakes on a new 15-ton slab handling crane which recently went into service at their Cleveland Works. Rapid movement of the slabs with maximum safety for personnel are of vital importance to J&L's management and the G-E brakes are fulfilling these requirements.

The General Electric DC brake offers full-rated torque in the worn-gap position, (extra braking torque when you need it most) as well as features like single point adjustment, easily removable linings, armature-gap indicator, positive manual release, versatility of installation, and conformation to AISE Standards.

For more information about the General Electric direct-current brake contact your nearest G-E Apparatus Sales Office, or write for bulletin GEA-6214. Section 781-11, General Electric Company, Schenectady 5, New York.



SPECIFIED BECAUSE OF EXCELLENT PERFORMANCE by new G-E brake (opposite page), three G-E DC brakes were ordered by Jones & Laughlin for this 15-ton slab handling crane at the company's Cleveland Works.

Progress Is Our Most Important Product

GENERAL ELECTRIC

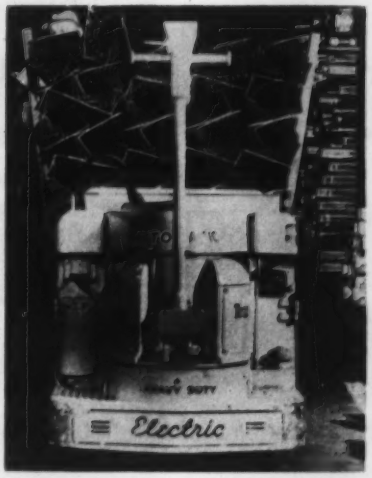
More Space for Storage

ADVANCED PLANNING and maneuverable handling trucks gained 20 per cent more storage space for Inland Steel Products Co., Milwaukee, when it converted half the main floor of its manufacturing plant into a warehouse.

Materials handling at the metal fabricating firm is highly mechanized. It utilizes some 20 industrial trucks, ranging in capacity from 3000 to 15,000-lb units.

Problem — Handling is complicated by the unusual size and shape of several principal products —rain-carrying materials, such as galvanized gutters, downspouts, pipe and roofing items, which are cut in standard, 10-ft lengths.

Since finished products are hauled and stored on 8-ft skids, which can not be stacked to make use of cubic-storage space, all space savings have to be made on the floor area of the 207,000-sq-ft warehouse.



Platform trucks haul loads weighing 5500 lb in narrow warehouse aisles

Solution — The company purchased three, operator-led, platform trucks with custom-built, 96-in. platforms to support the 10-ft loads, from Automatic Transportation Co., Chicago. The ability of these trucks to maneuver at right angles in 10-ft aisles enabled Inland to set up aisle widths 1 ft less than was at first thought possible. Aisles are only 4 ft wide.

Another feature of the firm's handling operation is the use of an accumulation depot for finished products near the fabrication area. The depot helps conserve storage space and reduce traffic and confusion in the warehouse—materials ready for immediate shipment can be taken from this area to shipping docks.

Tight Squeeze—Narrow loading docks presented another handling problem which was effectively solved by the use of platform trucks. The dock is 12 ft wide, but column spacing reduces effective operating space to 10 ft. The trucks easily maneuver their 10-ft-long loads onto the dock and through 6-ft-wide boxcar doors.

Complete records are kept on each industrial truck at Inland. Maintenance costs are reduced to a per-operating-hour figure. Records indicate the three platform trucks operate at 13 cents an hour.

FOUND HERE WORLD FAMOUS AIRCRAFT ARE "BORN"

GRAND RAPIDS GRINDERS

Grand Rapids No. 55 Hydraulic Feed Surface Grinder
This precision tool room type machine Table speed up to 125 fpm. Working surface of table is 12" x 36". Vertical movement of wheel head 18". Preloaded ball bearing spindle greased for life. Spindle speeds 1925 and 2500 rpm.

Just take a look in their toolrooms! Every one of these famous aircraft manufacturers uses Grand Rapids Grinders . . . engineered and built for unusual long life of precision grinding. Our Model 55 shown here, for instance, features column and base of massive, one-piece casting for vibrationless rigidity and permanent alignment. Both longitudinal table travel and cross feed are hydraulically actuated. Wheel head has powered rapid vertical travel. Table speed is variable up to 125 fpm . . . faster than any other of this type and size.

That's why so many tool room men insist on Grand Rapids Grinders.

Just a note on your letterhead will bring you full details.

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can now be
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at down-to-earth
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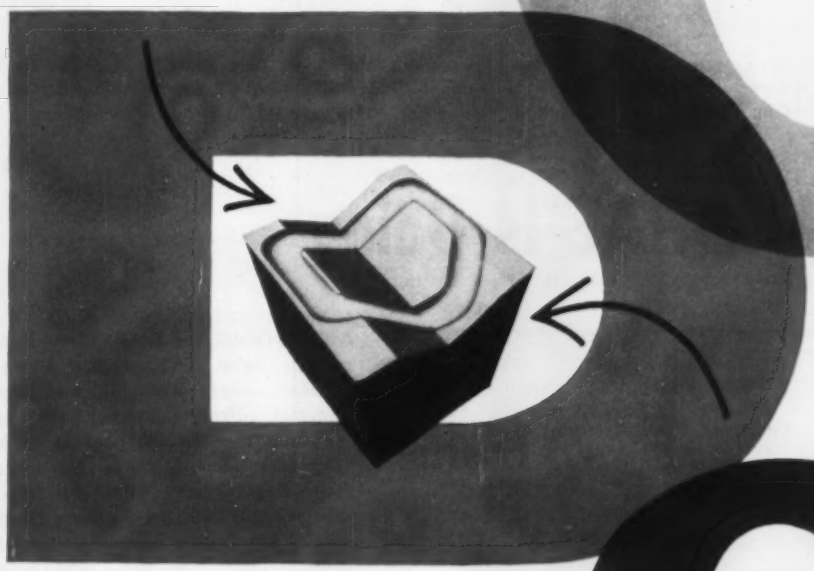

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in the full quantity required.
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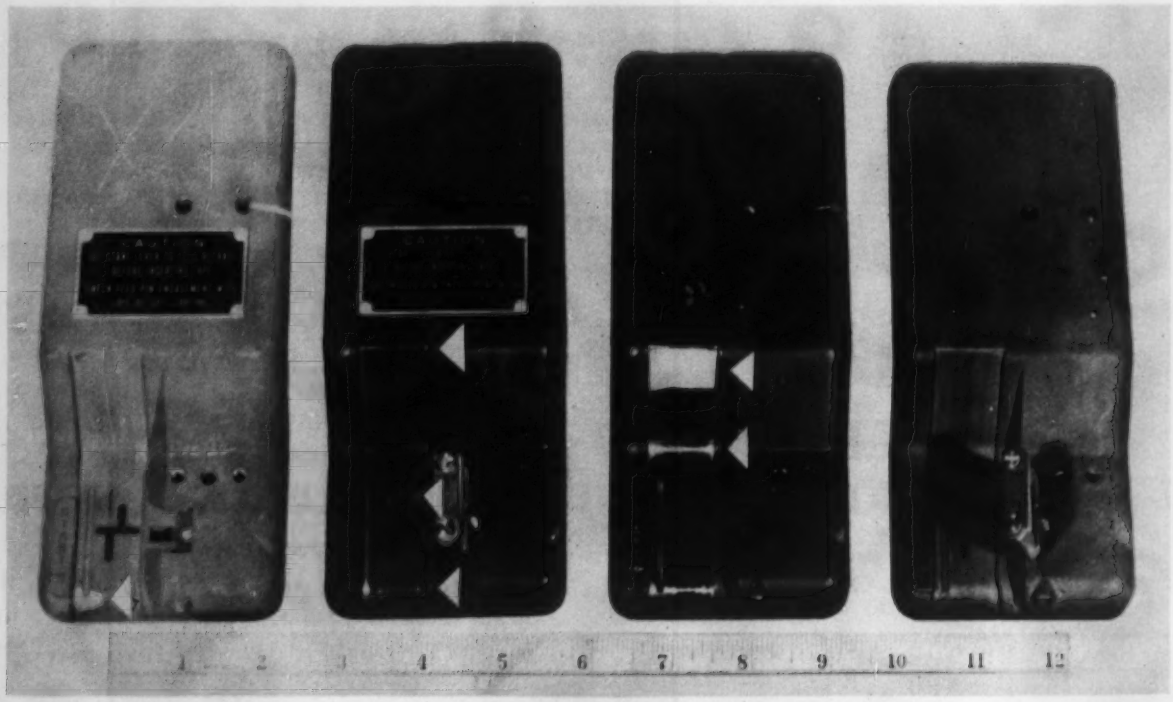


How HAE stacks up abrasionwise on die-cast tape guides for the Kleinschmidt teleprinter. Left to right: 1. Magnesium coated with Dow 17—265 hours to failure. 2. Black anodized aluminum—50 hours to failure. 3. Chrome-plated aluminum—300 hours to failure. 4. Magnesium coated with HAE—more than 4000 hours without failure

How HAE Is Doing

How HAE Is Being Used

	Abrasion resistance	Corrosion resistance	Heat resistance	Thermal shock resistance	Good paint base	Good dielectric
Aircraft brake systems	X	X(c)				
Aircraft fuel gages		X(a)				
Cable drums	X(b)	X(c)			X	X
Ship's conduit boxes		X(a)				
Radar feed horns		X(a)			X(d)	
Gear trains	X(b)	X(c)				
Sonar equipment	X	X(c)			X	
Hydraulic pumps	X	X(c)				
Jet engine parts	X	X(a)	X			
Casting repairs		X				
Oil separators		X(a)			X	
Radar units		X(a)			X	
Tape guides	X					
Torpedoes		X			X(a)	
Turbine housings	X	X	X	X		
Wheel castings		X			X	

a. painted b. graphite coated c. with epoxy resin sealer d. with silicone varnish sealer

AN ANODIC treatment for magnesium called HAE created a stir in May, 1951, when it was announced. How is it doing now?

It was reported to possess high electrical insulating properties which prevented galvanic corrosion, to protect magnesium from attack by sea water and corrosive atmospheres, to be hard enough to scratch glass and strongly resistant to wear and abrasion, to be a good heat insulator and to provide an excellent surface for paint adhesion.

The claims appear to be borne out by a brisk business in military applications, many still on the classified list (see table).

Although military wraps came off the process in 1953, civilian growth has been slow. Since October, 1952, when Brooks & Perkins Inc., Detroit, began to develop the commercial process, other promising treatments have ap-

peared: The Dow 17 anodic coating offers a close comparison, and there are chemical conversion coatings against which HAE must make its way.

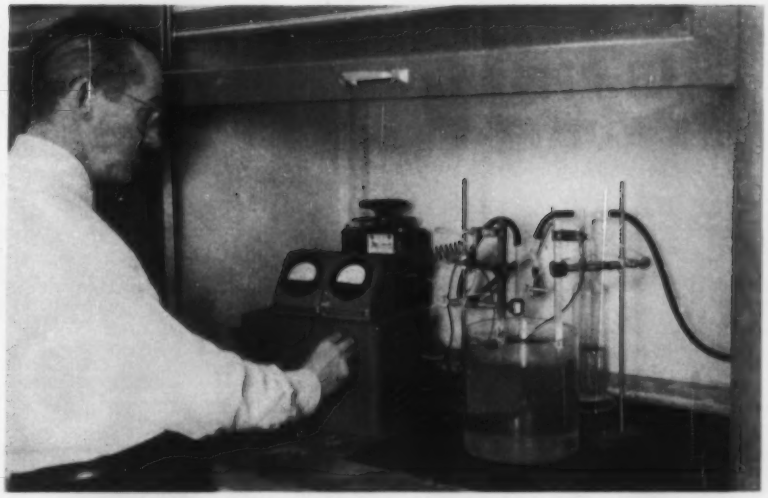
Tape Guide—One application for which HAE has shown itself well suited is the tape guide on a Kleinschmidt teleprinter. The paper tape running over the guide has a highly abrasive, 50-per-cent, china-clay content. After 4000 hours of continuous operation, the HAE ceramic surface of this magnesium part showed no wear; other coatings on magnesium and aluminum showed wear-through in 400 hours (see photograph).

Other Applications—Widest use for HAE thus far stems from its ability to resist salt spray. Coated magnesium alloy panels show no corrosion up to 24 hours exposure in salt spray and only isolated pin points of corrosion up to 200 hours exposure. But a waxed HAE coating showed no corrosion after 13,000 hours exposure in salt spray. The same surface coated with a zinc-chromate primer or phenolic finish has shown similar resistance to salt corrosion.

HAE has the brittleness typical of ceramics. A panel can be bent 160 degrees and straightened without cracking on the tension side, but the coating flakes off on the compression side. Epoxy resins and vinyl paints applied over the coating increase its elastic limits and may make possible riveting and bolting the coating without damage.

Technique—The process uses 15 amp per sq ft. Treatment time is about 60 minutes. The electrolyte is alkaline, containing potassium hydroxide, aluminum hydroxide, trisodium phosphate, potassium fluoride and potassium permanganate. Typical coating is 0.001 in. thick.

Hot alkaline cleaning followed by a cold water rinse is the only pretreatment necessary since the process is partially self-cleaning. It will form a coating in the presence of chromate films. Recommended hydrofluoric acid posttreatment followed by aging at 170° F and 80 to 95 per cent moisture for 3 hours may be eliminated if organic finishes are to be applied over HAE.



NBS was developed in National Bureau of Standards laboratories

More Magnesium Coatings—Add NBS

LOW VOLTAGE and a simple bath—these are standout features of an electrolytic coating process for magnesium called NBS. It was developed at the National Bureau of Standards.

It isn't a second HAE (see opposite page), but it has these advantages: Excellent salt spray corrosion resistance, plus potential savings through lower current and chemical costs.

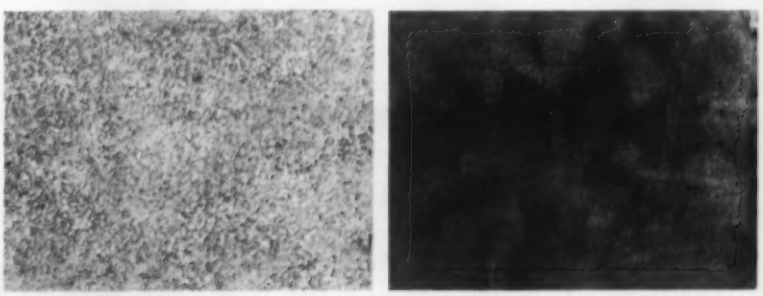
NBS—The process is similar to electroplating, except that alternating is used instead of direct current, and the coating is formed on both electrodes. It differs from the HAE and acid chromate anodizing processes in two respects: 1. It usually operates at 10 to 12 v, ac. 2. The electrolytic bath contains only water, sodium or potassium hydroxide and the corresponding chromate.

To form a coating 1 to 2 mils thick on magnesium alloy electrodes, current of 80 to 140 amp per sq ft is passed through the bath for 20 to 40 minutes. Bath temperature is 150 to 170°F.

Coating—Complete coverage of panels can be obtained at 140°F and 80 amp per sq ft, but as current density goes up, so does the minimum temperature requirement.

The gray-green coating is smooth, but less uniform than HAE or acid chromate coatings. On the other hand, it has greater resistance to corrosion, as revealed by salt spray tests.

Corrosion resistance depends on current density and bath temperature. Current below 80 amp per sq ft, and temperatures above 170°F produce inferior coatings. So does the use of direct instead of alternating current.



Magnesium under salt spray. Left, uncoated; right, NBS coated

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For economical, long-lasting furnace linings, rely on Laclede-Christy. Emphasis on "quality first" in manufacture gives Laclede Refractories an unsurpassed service value wherever they are used.
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Your use of Laclede-Christy refractories is your assurance of steady, economical production. You get "quality-first" product performance, verified by many, many service records. You get refractories to meet your exact requirements. You get quick, efficient service from nearby Laclede-Christy plants or distributors' warehouses. Call now.

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DIVISION OF H. K. PORTER COMPANY, INC.

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Short-Haul Cranes

They move their loads only 16 ft to solve a handling problem and boost production

HEAVY steel plates move swiftly onto a trimming table and off again with no lost time at Chicago Bridge & Iron Co.

Two underhung cranes, operating on a runway 60 ft long with a rail span of 28 ft, do the job. Each crane has a 12-ton capacity and an 8-ton hoist. Each hoist has a spreader bar which is 25 ft long and has three electric magnets.

Handling Cycle—The crane farthest from the main aisle of the plant picks up a plate from a storage pile and moves it 16 ft to a cutting table. Two operators position multiple-head cutting torches to trim the four edges of the plate.

HANDLING CRANES
. . . unload and load cutting table

As soon as the torches are swung away from the work, the other crane picks up the plate and moves it out into the main aisle—another 16-ft trip. While one finished plate is removed, an untrimmed plate is brought into position for cutting.

Both Whiting Trambeam cranes are operated by pushbutton, pendant controls. The runway extends a short distance into the center aisle, so an overhead traveling crane can pick up the trimmed plates with no intermediate handling.

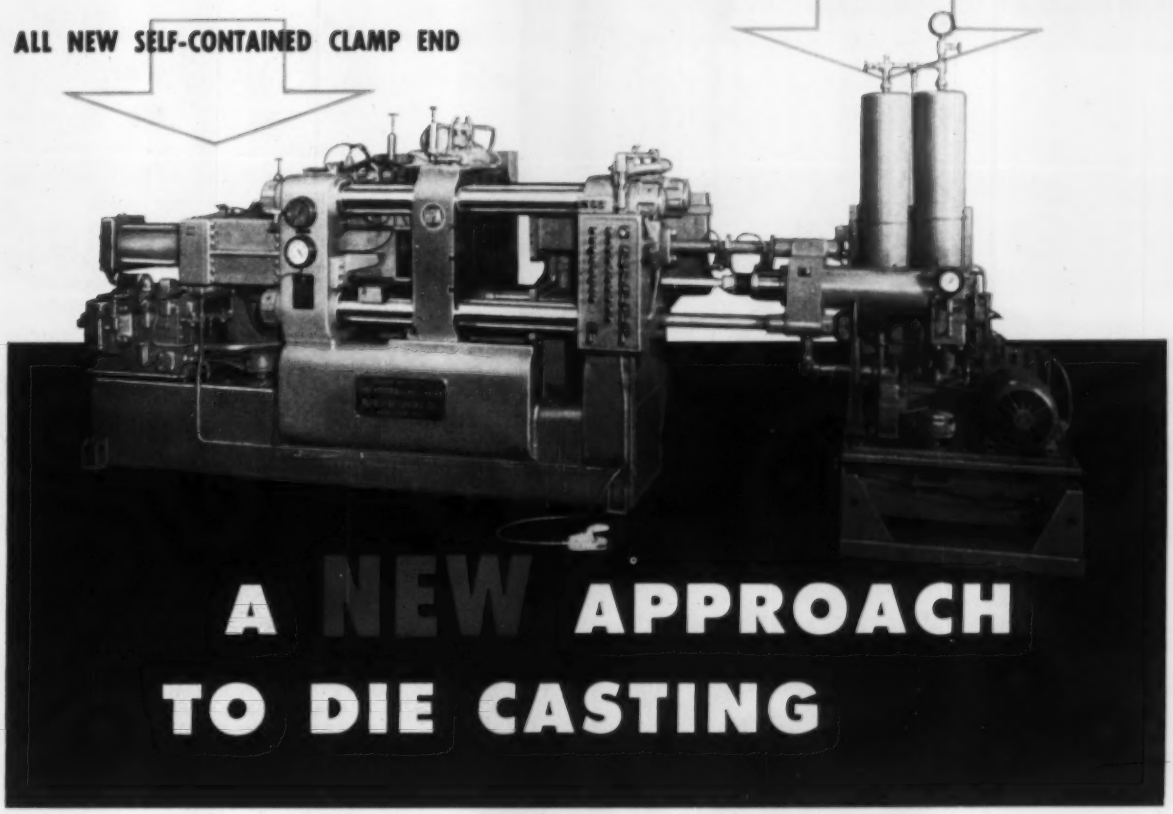
Metallurgy

Procedures in Experimental Metallurgy, by A. U. Seybolt and J. E. Burke, describes most of the important laboratory techniques used in the preparation of metals and alloy specimens for research.

The book, published by John Wiley & Sons Inc., 440 Fourth Ave., New York, sells for $7.00.

ALL NEW SELF-CONTAINED INJECTION END

ALL NEW SELF-CONTAINED CLAMP END



A NEW APPROACH TO DIE CASTING

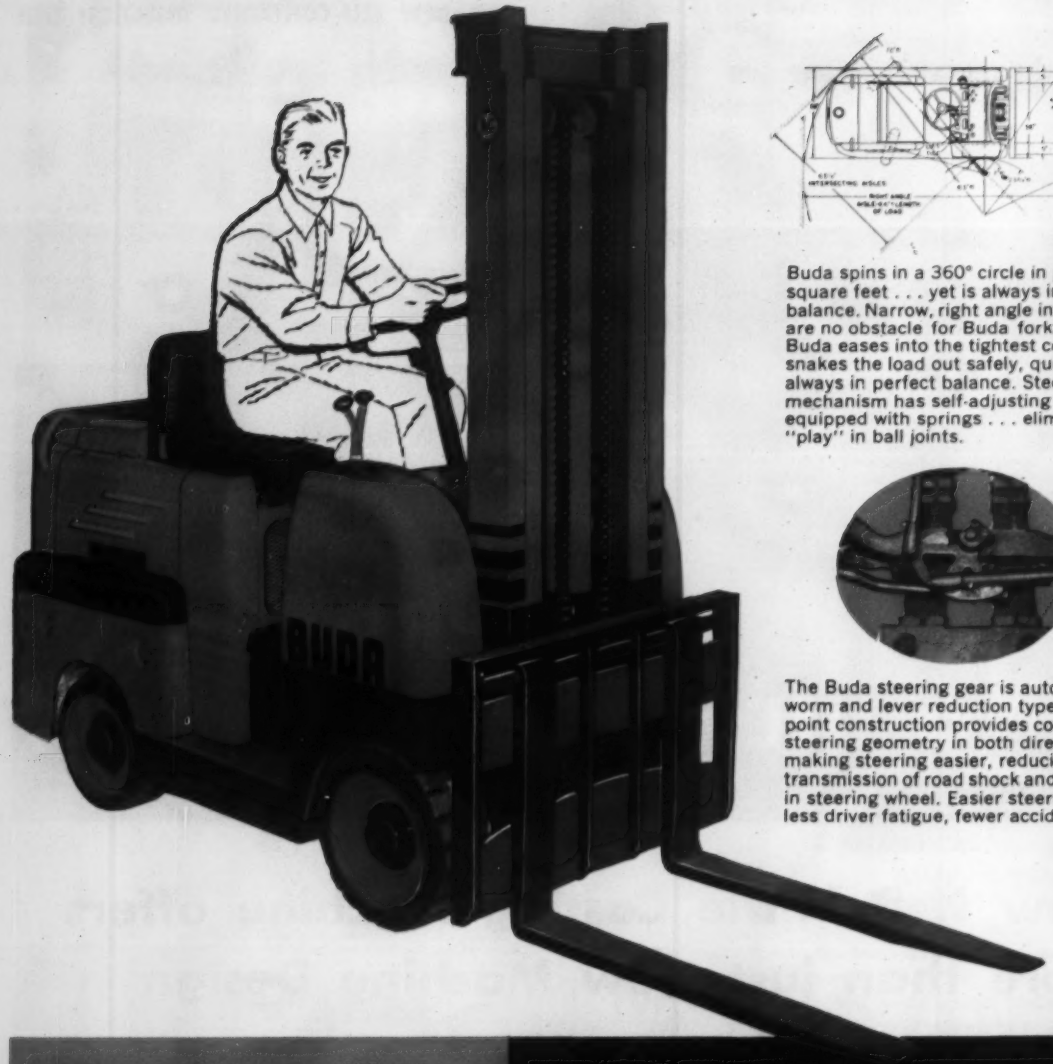
New H-P-M Die Casting Machine offers more than just New Machine Design

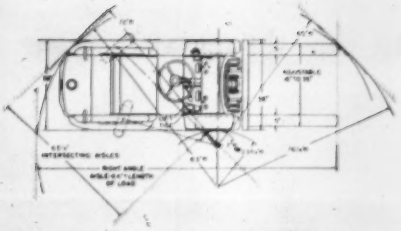
The new H-P-M die casting machines are being hailed as the most important advancement in die casting in fifteen years, and rightly so . . . more than forty new and improved features! These features result in minimum mold flash . . . faster die set-up . . . greater versatility in die usage and casting design... reduced maintenance . . . maximum safety and performance. The new self-contained Link-Wedge mold clamp is the best. There's plenty of "beef" in these new models. They are available in a complete range of sizes...cold chamber or gooseneck types.

Write for Bulletin 5400 which describes these new units in detail.

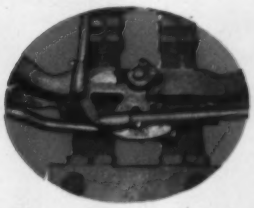
HPM

THE HYDRAULIC PRESS MFG. COMPANY
1044 Marion Rd., Mount Gilead, Ohio, U. S. A.





Buda spins in a 360° circle in just a few square feet . . . yet is always in perfect balance. Narrow, right angle intersections are no obstacle for Buda fork lift trucks! Buda eases into the tightest corners, snakes the load out safely, quickly, always in perfect balance. Steering mechanism has self-adjusting ball joints equipped with springs . . . eliminates "play" in ball joints.



The Buda steering gear is automotive worm and lever reduction type. Center point construction provides correct, steering geometry in both directions, making steering easier, reducing transmission of road shock and kick-back in steering wheel. Easier steering means less driver fatigue, fewer accidents!

BUDA

IS THE MOST MANEUVERABLE FORK LIFT TRUCK IN THE FIELD

FREE CATALOG tells how Buda Fork Lift Truck can cut the costs of handling in your plant. Send for it today!

THE **BUDA** DIVISION

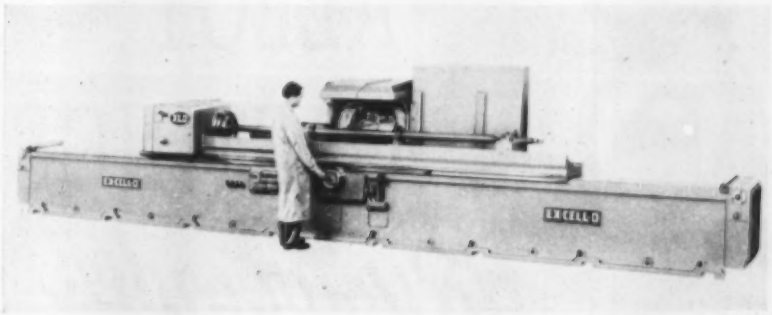
Allis-Chalmers Manufacturing Company

Harvey, Illinois

Thread Grinder Holds Tolerances on Long Work

Grinding long threads on such parts as aircraft actuator screws and machine tool lead screws is simplified with a new, large thread grinder.

Known as the Style 120, it will grind 10 ft of thread length in one setting, will handle work up to 12 ft long between centers and will hold close tolerances on form, pitch diameter and lead. Workpieces longer than 12 ft can be inserted through the work spindle. Threads longer than 10 ft can be ground a section at a time or the work can be turned end for end. The lead at adjacent sections can be picked up and accurately continued.



Automatic features of the machine include feed to finish size, grinding wheel dressing, resumption of the grinding cycle after dressing, backlash compensation, control of coolant flow, lubrication and retracting the grinding wheel at the end of the grinding cycle.

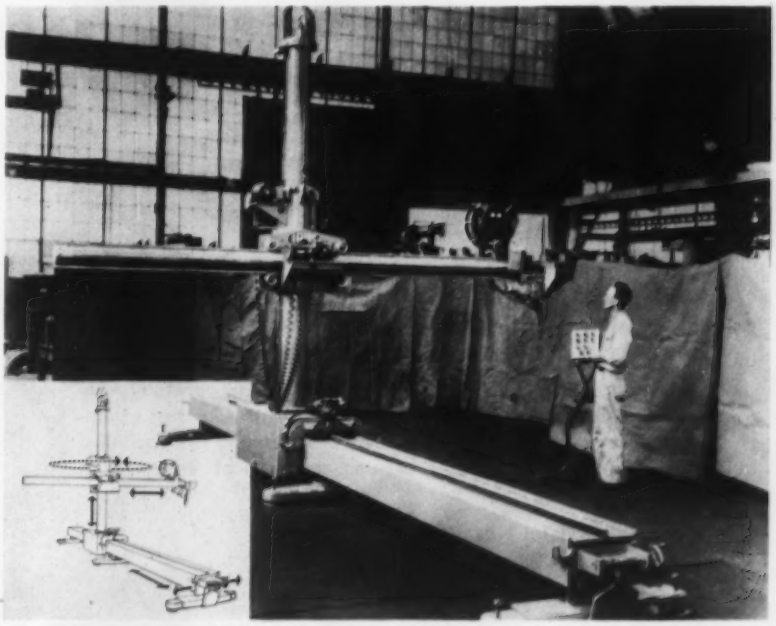
The work table is supported the full distance of its travel. Antifriction rollers under it provide ease of movement and contribute to accuracy. Base ways are covered and protected by a wide belt. Attached at both ends of the table, the belt travels on rollers around the ends of the machine and under the base as the table moves. *Write:* Ex-Cell-O Corp., 1200 Oakman Blvd., Detroit 32, Mich. *Phone:* Townsend 8-3900

Portable Fixture Reduces Welding Setup Time

Designed to handle a variety of weldments, the "Universal" fixture features full portability, simultaneous three-directional travel, 360-degree boom rotation and an adjustable base. Attach any standard head, and it becomes an automatic welding, flame cutting or hardening unit.

Because of its adjustable base, setup time, particularly for large weldments, is reduced as much as 60 per cent. Aligning for longitudinal and transverse welds is done rapidly with an adjusting wheel at one end of the base. Once setup is completed, the unit is operated by remote pushbutton controls that permit simultaneous three-directional travel. Speed of the operation is infinitely variable; it ranges up to 72 inches of travel a minute.

A lifting eye is set in the top of the column for crane lifting and portage. It also permits the machine to be raised and set on blocks to accommodate weldments which are larger than its normal capacity.

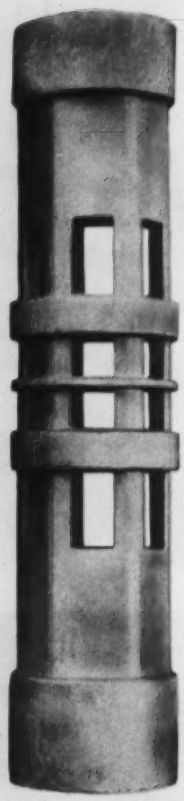


The fixture has 18 ft of longitudinal travel and can be furnished with booms and columns of various lengths. Transverse travel of the boom and clearance under it range from 8 to 12 ft, depending on the size of the unit. *Write:* Lewis Welding & Engineering Corp., 15 Interstate St., Bedford, O. *Phone:* Bedford 2-2500

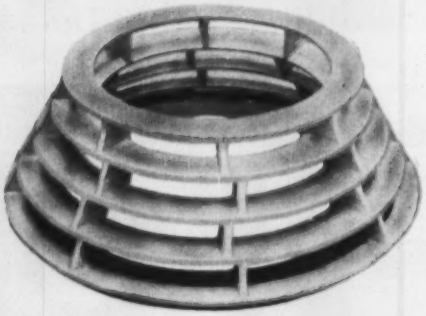
DURALOY

HIGH ALLOY CASTINGS

to your order



LARGE
SMALL
SPECIAL SHAPES
CORROSION RESISTANT
HEAT RESISTANT
ABRASION RESISTANT



Duraloy is the BEST place to come for your high alloy casting requirements. We are specialists in turning out castings to order. Simple jobs, tough jobs; large jobs, small jobs. Static cast or centrifugally cast... you name it and we'll produce it.

The melt, the casting and the finishing are all carefully controlled and quality tested by our technicians. Our test equipment, including 400,000 volt X-ray and gamma ray facilities, is just one way Duraloy assures delivery of Better High Alloy Castings.

Send for Bulletin No. 3354-G.

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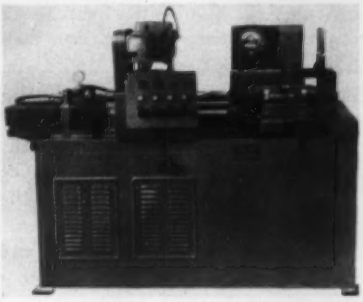
CHICAGO OFFICE: 332 South Michigan Avenue

NEW PRODUCTS and equipment

Automatic Honing Machine

Here is a single-spindle machine with a two-position fixture and automatic air gaging built into the honing mandrel. After each cycle, the gage moves into the bore just honed. Movement of the honing head, fixture and air gage is hydraulically controlled and actuated by solenoids.



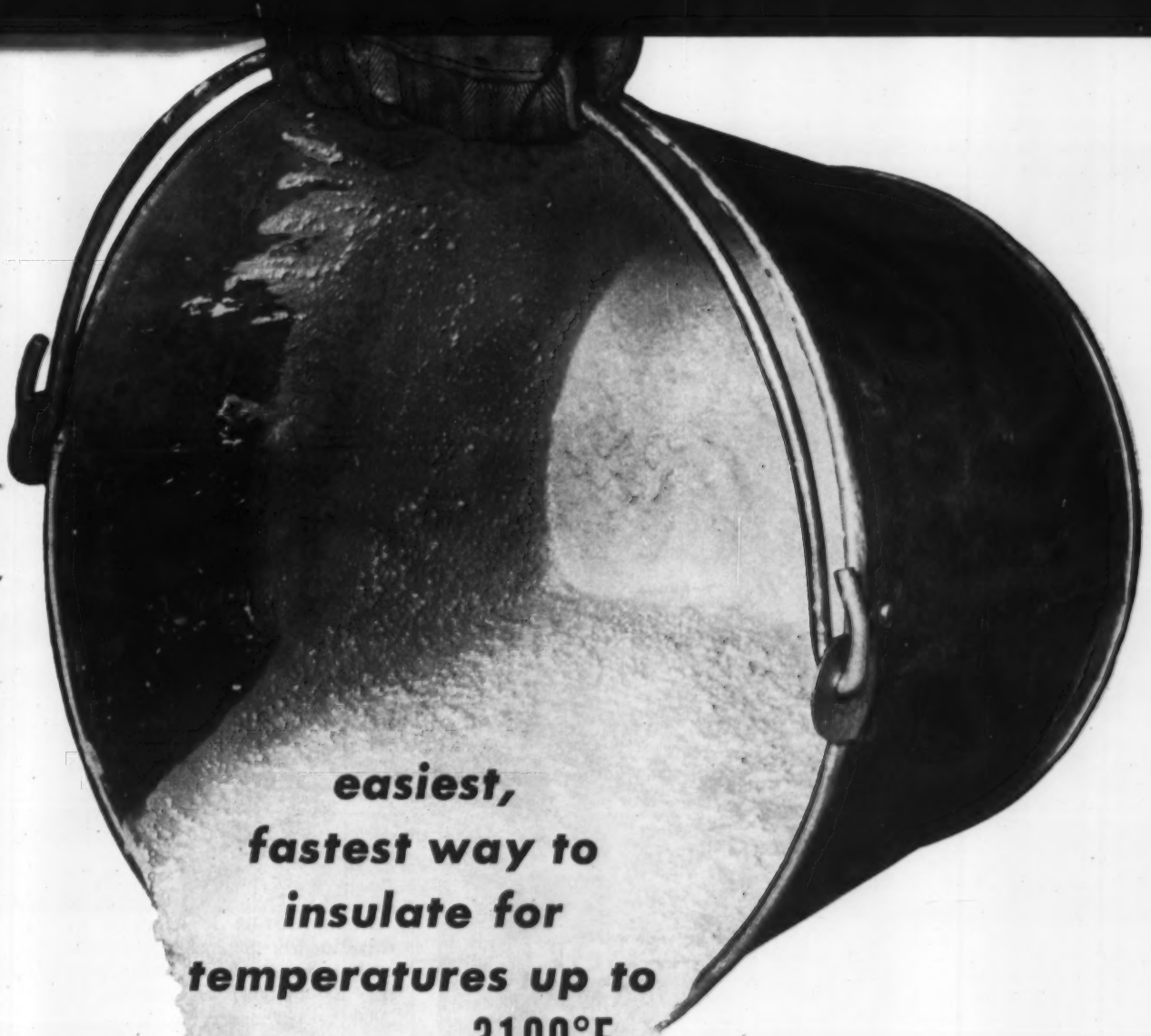
Air maintains constant pressure on stone expansion. Air also controls rapid expansion and release of the honing stones at the beginning and end of each cycle. A push-button control panel with signal lights governs the entire operation.

A built-in electric timer allows variable cycling for most efficient operation. The machine has a steel base containing the hydraulic system and coolant unit. The electric control panel is mounted to the back. Each machine is built to customer specifications. *Write:* Superior Hone Corp., 1620 Elreno St., Elkhart, Ind. *Phone:* Elkhart 4-0496

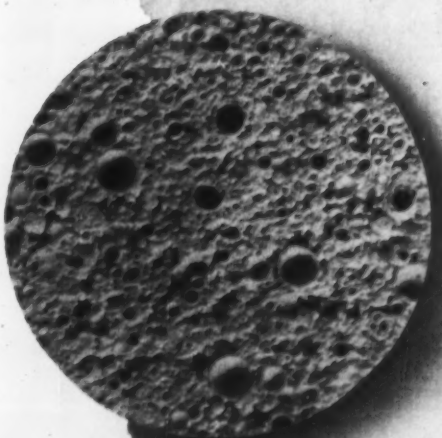
Welders Stress Operating Convenience

On a new line of transformer-type arc welders, current selection is made with a rubber handwheel and a rheostat knob. Both voltage and amperage are controlled to give the desired arc characteristic for a variety of jobs.

The transformer is of the saturable-leakage path type. The core is welded and coils are firmly anchored for quiet operation. The absence of electrical connections between power lines and welding cables makes the welder extremely safe. Double insulation and physical separations between the pri-



easiest, fastest way to insulate for temperatures up to 3100°F



Here's why ALFRAX cement insulates so well: A sliced-through section of set cement reveals the secret: dead air space in the thousands of closely-packed bubbles of alumina.

CARBORUNDUM
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ALFRAX® castable aluminum oxide cements are just about the most effective insulating materials you can find for temperatures up to 3100°F—and especially so at the upper end of the temperature range. They consist of tiny bubbles of pure alumina held together by a bonding agent.

These castables make ideal back-up linings for nonferrous crucible furnaces and for the sidewalls of reverberatory furnaces. Or you can cast them into burner blocks for core ovens and malleable annealing furnaces. Aluminum oxide is one of the most stable and inert of all materials . . . is highly resistant to practically all furnace conditions. And to use, all you do is mix it with water and pour.

So, if you're looking for a castable insulating material to stand really high operating temperatures . . . and keep on standing them through a long, useful life . . . you can end your search right now by writing us for free engineering information on these highly refractory, low heat capacity, easy-to-use cements. Address Refractories Division, The Carborundum Company, Perth Amboy, N. J., Department W55.

Bailey

GOGGLE VALVES

For shutting off gas mains from 6" to 72" in diameter, these valves are the means to complete safety, complete dependability. Whether they are used every day or as infrequently as once a year, they open or close instantly. A tight, sure seal is provided by a clamping force applied equally at all points around the disc periphery. The same powerful mechanism frees the goggle plate.

If desired, Bailey Goggle Valves may be totally enclosed. Both types—open and enclosed—require only a minimum of maintenance.

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ENGINEERS
LEADERSHIP THROUGH QUALITY
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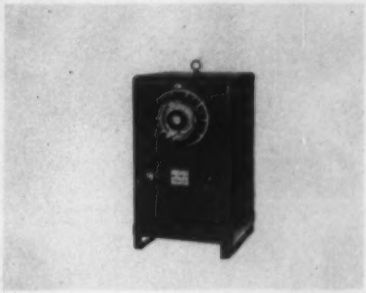
mary and secondary coils prevent possibilities of line voltage carrying over to the welding circuit.

Model TLP-253-S (with capacitors) and TL-253-S (without capacitors) are dual rated at 250 amp on 30-per-cent duty cycle, or 200



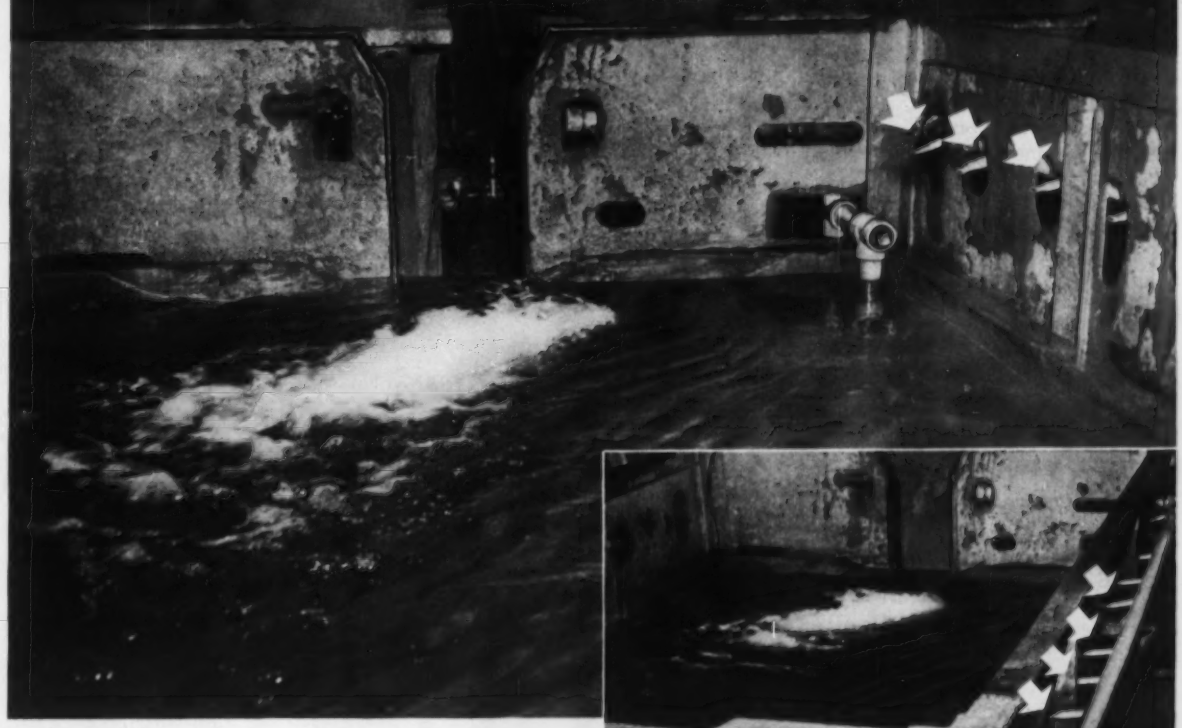
amp on 50-per-cent duty cycle for operation on single-phase, 60-cycle, 230-volt, ac supply line. *Write:* Hobart Bros. Co., Hobart Square, Troy, O. *Phone*: Troy 2-1223

Gasket-Mounted Pressure Switch

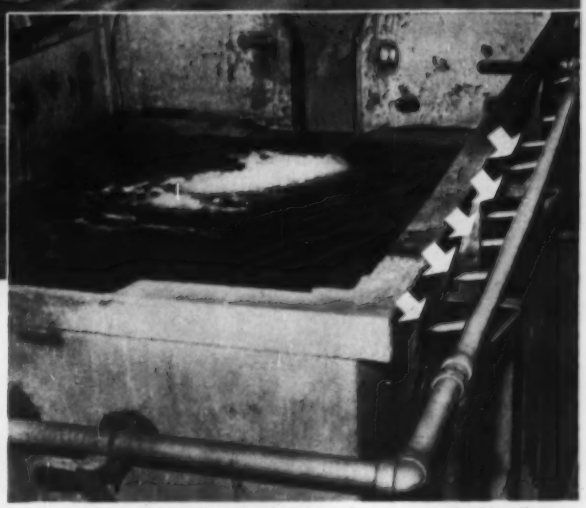
Series SG1-02 is available in three models for coverage of several pressure ranges: 100 to 1000 psi, 100 to 2000 psi and 500 to 5000 psi. Pressure settings are adjustable throughout the complete pressure range of each model. Over-all dimensions for all

three are 3⅞ x 7 11/16 x 2 in. Nominal current ratings are 10 amp at 110-125 v, ac, for the 100 to 1000 psi size; 5 amp at 220-

FOR AN ACID CONDITION, THERE'S NOTHING LIKE U. S. Uscolite Plastic Pipe



Uscolite nozzles (arrows) are used to wash acid off steel stock.



Close-up of Uscolite pipe which carries water to the Uscolite nozzles (arrows). The tanks are lined with U. S. corrosion-resistant Permobond rubber lining.

A large manufacturer of wire and cable in New England is one of the many who find U. S. Uscolite® Pipe immune to acid conditions. "Uscolite is the most effective material we have found for this service," says the management of the plant. Uscolite pipe and Uscolite nozzles are used to wash off acid after cable and wire are immersed in pickling baths —for two big reasons:

(1) Uscolite is immune to corrosion from the splash-drip and spray off the steel stock as it comes from the pickling bath.

(2) Uscolite nozzles not only last far, far longer than metal nozzles, but they also require no clean-out.

Uscolite piping is a product of United States Rubber Company. Both its interior *and* exterior are resistant to acids, salts, alkalies, gases. Despite Uscolite's great impact strength, it is surprisingly light in weight. You can also order it in pipe fittings and valves.

Whether ordering completely new piping, or getting replacements, specify U. S. Uscolite. Get in touch with any of the 27 "U. S." District Sales Offices, or write address below.

Uscolite pipe and fittings are made in the broadest and largest line of stock sizes on the market. Sizes follow:
● Molded fittings in ½" through 4" I.P.S. ● Molded flanges ½" to 6" I.P.S. ● ½" to 3" Uscolite diaphragm valve (Hills-McCanna). ● Pipe in standard wall dimensions and extra heavy wall dimensions in ½" through 6" pipe sizes.

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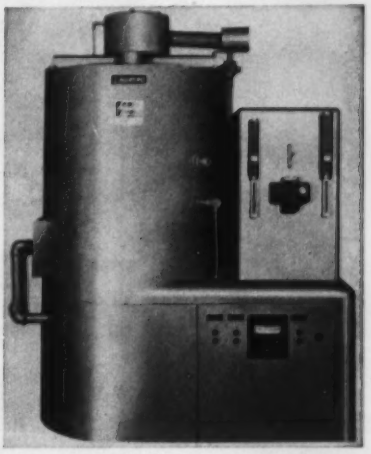
250 v, ac, for the 100 to 2000 psi size, and 3 amp at 440-460 v, ac, for the 500 to 5000 psi size.

The switch is said to provide ease of installation, maintenance and replacement when applied to hydraulic presses, production and processing machinery, machine tools and other industrial, oil-hydraulic equipment. *Write:* Vickers Inc., 1400 Oakman Blvd., Detroit 32, Mich. *Phone*: Townsend 8-5100

Atmosphere Generator

Here is an endothermic gas cracking generator, which is completely wired, piped and assembled in a package unit. Called the HYEN Hydryzing Generator, it is fully automatic, producing a low-cost protective atmosphere for bright hardening, bright annealing or bright brazing of steel.

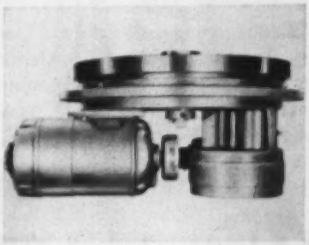
The unit has automatic controls for temperature, mixing, pressure and flow. An operator can cut a furnace into or out of the atmosphere line without returning to the generator each time. The unit can be placed in a spot remote from the heat treating furnace.



Generators are available in 500, 750 and 1500 cfh sizes. *Write:* Lindberg Engineering Co., 2450 W. Hubbard St., Chicago 12, Ill. *Phone:* Monroe 6-3443

Power-Driven Automatic Index Table

They are available in 21 and 34-in. diameters, with 6, 8 or 12 stations. The Geneva drive uses a needle-bearing cam follower operating in ways faced with hardened and ground tool-steel wearing plates. The hardened and ground tool-steel lock pin (actuated by a cam plate) enters the ways before the cam follower leaves them. At



no time in the operation of the table is it freewheeled. It will not get out of time or mis-index. The table is driven by a 220-440-v, 3-phase, 60-cycle, 1800-rpm brake

ARDCOR 1½-F ROLL FORMING MACHINE with two 30-TON ARDCOR PRESSES performing pre-notching and cut-off operations
Roll Forming equipment completely designed, engineered and manufactured by one highly experienced source.
RESULTS: ARDCOR Integrated "Package" Installations consistently prove this advantage with precision forming at modern high speeds—better roll formed products! Consultation without obligation.
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ARDCOR ROLL FORMING MACHINES
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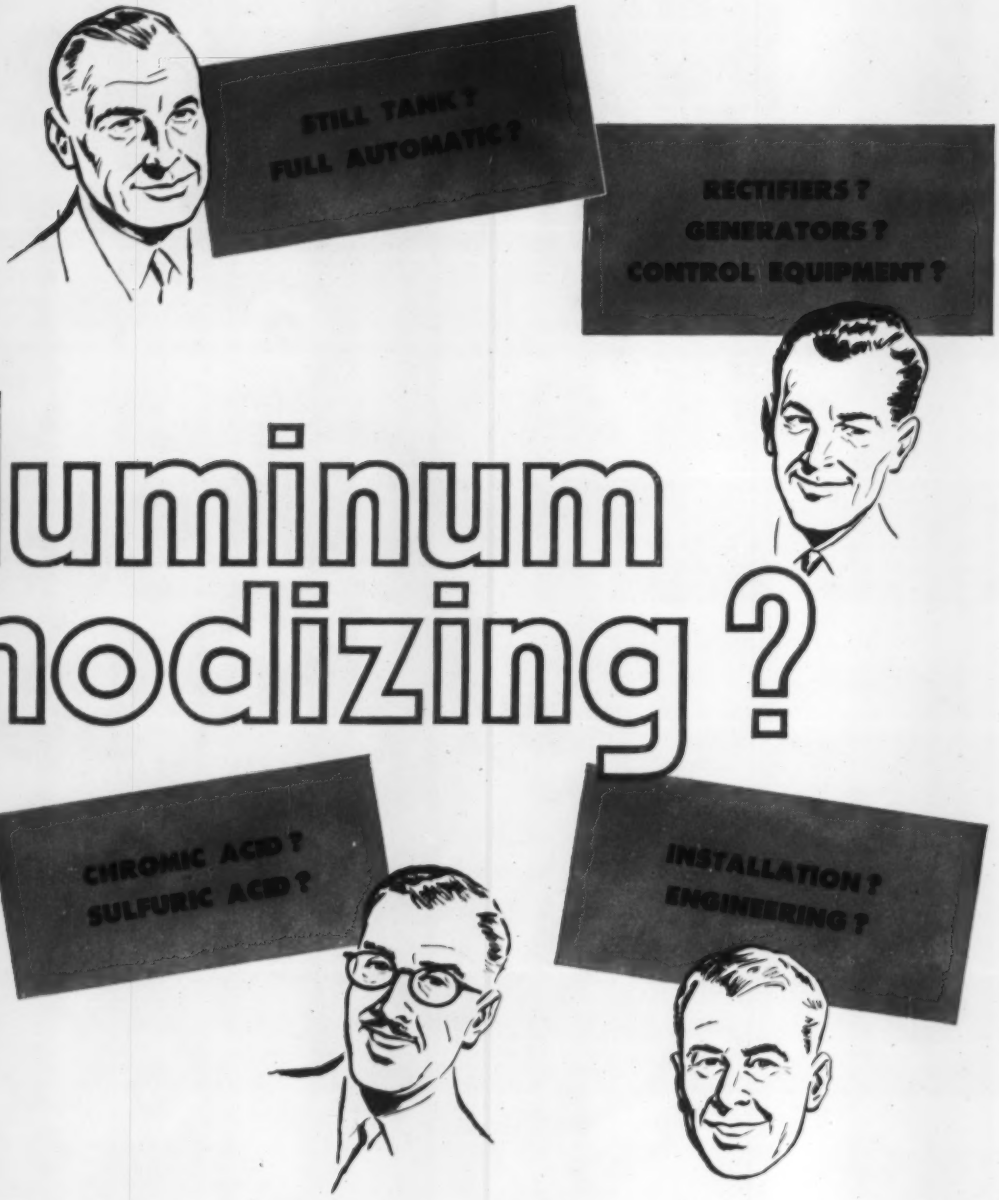

At any stage, from planning to production, your problems can *best* be solved by H-VW-M . . . the one company combining complete engineering service with a complete line of equipment, processes and supplies.

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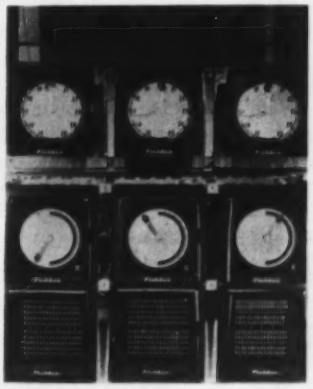
INDUSTRY'S WORKSHOP FOR THE FINEST IN PLATING AND POLISHING PROCESSES • EQUIPMENT • SUPPLIES

motor through a bronze worm and gear reduction unit.

The 21-in. model is driven by a ¾-hp motor and has a load capacity of 400 lb, with an indexing cycle of 1.5 seconds. It may be equipped with top and plates up to 32 in. in diameter. With a work cycle of 3 seconds, it is capable of 800 operations an hour. The 34-in. table, driven by a 1-hp motor, will carry an 800-lb load with an indexing cycle of 2 seconds. It may be equipped with top plates up to 48-in. in diameter. With a work cycle of 4 seconds, it is capable of 600 operations an hour. *Write:* Cleveland Tapping Machine Co., Canton, O. *Phone:* Canton 6-3453

Indicating Scanner

This electronic instrument makes it possible to test and control industrial processes from a single vantage point continuously. The indicating scanner monitors process variables involving level, temperature, thickness, mechanical movement, tolerance, weight and pressure. It will keep a steady check on 6, 12, 24, 48 and more



steps in a manufacturing process.

Speed of scanning depends largely upon the number of points to be checked, with a maximum rate of one point per second. Where there is a process that strays beyond the preset control zone, the scanning stops and actuates an alarm or flashes a signal. The indicator dial shows the extent of the deviation. Associated control systems may automatically correct the condition. *Write:* Fielden Instrument Div., Robertshaw-Fulton Controls Co., 2920 N. Fourth St., Philadelphia 33, Pa. *Phone:* Garfield 6-6750

Synthetic Cutting Compound

Dromus Oil E, when dissolved in water, is a safe and economical cutting solution for use in all types of machine tools. It has exceptional cooling properties, and is stable at all temperatures normally encountered.

The product may be mixed with a large volume of water to utilize its high cooling effect. Properly prepared, the solution will not froth or foam objectionably, or form hard-to-clean sludge.

The addition of this oil to water prevents rusting of parts and improves the wetting characteristics

Here is a completely new electric-hydraulic forcing and straightening press, with construction and operating advantages never before offered in a low-cost shop press.

These are a few of the features:

- **Rapid Ram Approach** — Automatically changes to power stroke when it contacts the work.
- **Movable Workhead** — Self-contained—easy to center over the work. Workhead can be purchased separately.
- **Variable Ram Speed** — From zero to maximum under fingertip control.
- **Modern Design** — All operating controls at convenient working height.

These and dozens of other features are fully described and illustrated in new Bulletin No. 347, which we will send promptly on request. Send the coupon today.

DAKE PRESSES

DAKE CORPORATION
640 Seventh Street, Grand Haven, Mich.
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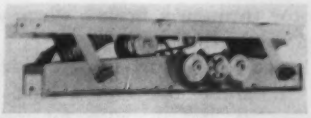
of the solution to reduce friction between tool and chip. *Write:* Shell Oil Co., 50 W. 50th St., New York 20, N. Y. *Phone:* Judson 6-5000

Oscillating Conveyor Has Minimum Moving Parts

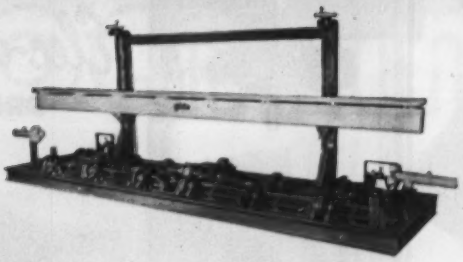
The G-W Oscilveyor is a vibrating trough driven by rotating, eccentric weights. It includes a drive unit, a trough resting on rocker arms and coiled springs and a supporting-base frame. Each conveyor may have any number of standard trough units.

Three eccentric weights on the drive assembly are held on individual shafts which are geared together (see photo) and driven by a countershaft belted to an electric motor. The assembly fits in a section of the conveyor which is 5 ft long. With this type drive, overloads cannot jam machinery or cause breakdowns. Long life is assured by mounting the coil springs and rocker arms on rubber pads. Coil springs contribute to long life and mean less maintenance. *Write:* Gifford-Wood Co., Hudson, N. Y. *Phone:* Hudson 8-1511



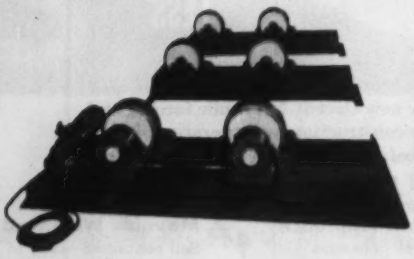
WEBB TANK PRODUCTION MACHINERY

REED TRACK SUPPORTS For Automatic Welding Head Carriages

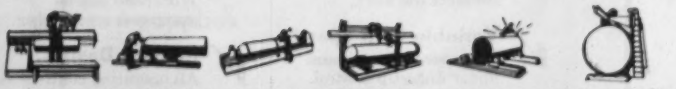


Increase production — use this fixture on 4' to 12' diameter work. Welding track is 24' to 34' long. Powered vertical adjustment is available for all models. May be used with your present turning rolls, welding positioners, special jigs for straight seam work, or portable type rolls illustrated below.

REED Portable Type TURNING ROLLS



For manual or automatic welding and other operations requiring rotation of a cylindrical vessel. Capacities range from 3 tons to 75 tons; larger units built to special order. Powered by electric motor with variable speed transmission. Readily portable, they may be used free or anchored to the floor as desired.



Horn Type Fixtures | Cylinder Flange Offsetters | Assembly Fixtures | Unit Type Turning Rolls | Portable Turning Rolls | Automatic Welding Track Supports

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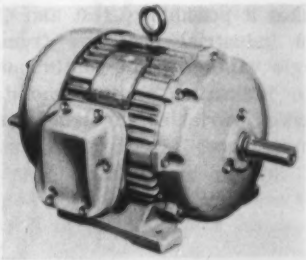
REED EQUIPMENT DIVISION THE WEBB CORP. WEBB CITY, MO. U. S. A.

Explosion-Proof Motors

Motor stocking is simplified with a new line of electric motors which has received Underwriters' approval for use in all Class I, Group D, and Class II, Groups E, F and G, hazardous locations.



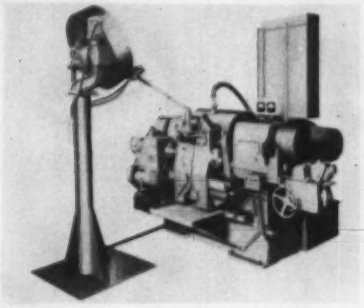
The motors are available in ratings of 1 to 25 hp, three phase; and 1 to 3 hp, single phase. Modifications of the three-phase motors also are available with Underwriters' approval for use in Class I, Group C, hazardous locations. *Write:* Louis Allis Co., Milwaukee 7, Wis. *Phone:* Sheridan 4-2510

Disc Grinder Processes Piston Pins

Pins from the hopper of this machine enter a stacking mechanism, are picked up automatically by a rotating carrier plate and clamped in hardened Vs. The carrier plate revolves between opposed grinding wheels, and 0.010 in. of stock is removed simultaneously from each end of the pins. Finish ground pins are unloaded automatically through a chute into tote boxes. Production: 2100 piston pins an hour.

Sizing devices continuously gage

NEW PRODUCTS and equipment



accuracy. When wear on faces of the grinding wheels is such that pins approach the high limit of tolerance, an automatic feed is actuated. This compensates for wheel wear, and permits spot checking of parts for size and squareness. *Write:* Mattison Machine Works, Rockford, Ill. *Phone:* Rockford 2-5521

Raised Hub Disc Wheel

Design changes take maximum advantage of the cutting ability of each abrasive grain. The wheel is said to remove metal faster with less work pressure. It permits easy grinding and blending of external corner welds and convex surfaces.

Strongly reinforced internally and on the back, the wheel is designed for all weld grinding and portable cutoff applications in metalworking plants and foundries.

The Blue Flash BF wheel, specification A-24R-BF, is available in 7 and 9-in. diameters, and 1/8, 3/16 and 1/4-in. thicknesses. *Write:* Bay State Abrasive Products Co., Westboro, Mass. *Phone:* Westboro 433

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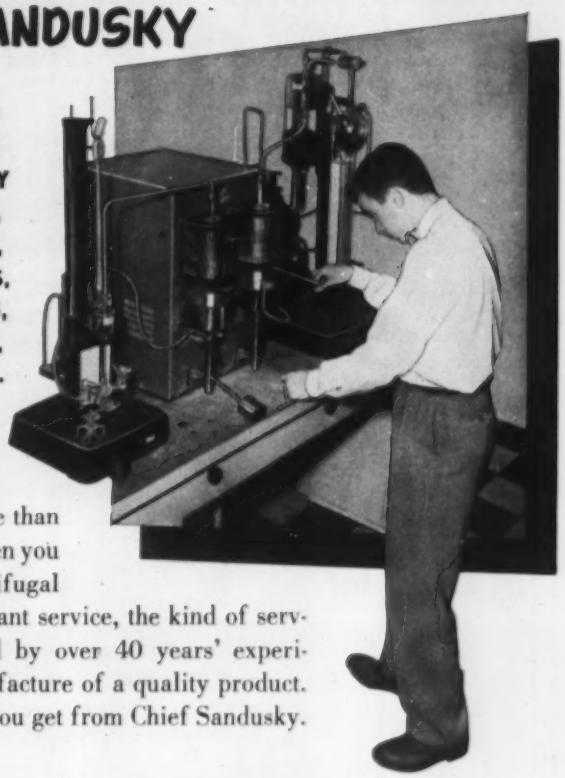
FERROUS AND NON-FERROUS CENTRIFUGALLY CAST SLEEVES, ROLLS, LINERS, TUBES, RETORTS, CHUTES, RINGS, BUSHINGS, BEARINGS, ETC.



You want more than just a product when you purchase centrifugal castings. You want service, the kind of service that's backed by over 40 years' experience in the manufacture of a quality product. And that's what you get from Chief Sandusky.

Our greatly expanded research department—enlarged in both equipment and staff—is always available to develop workable solutions to your multiple or one-of-a-kind design requirements. And with the recent addition of high-frequency induction melting furnaces, Chief Sandusky is now your logical source of supply for both ferrous and non-ferrous centrifugal castings. In addition to these services is the "plus" of practical help by field representatives or phone whenever a problem arises.

Remember, you can always count on Chief Sandusky for something extra in quality, product uniformity, and special service.

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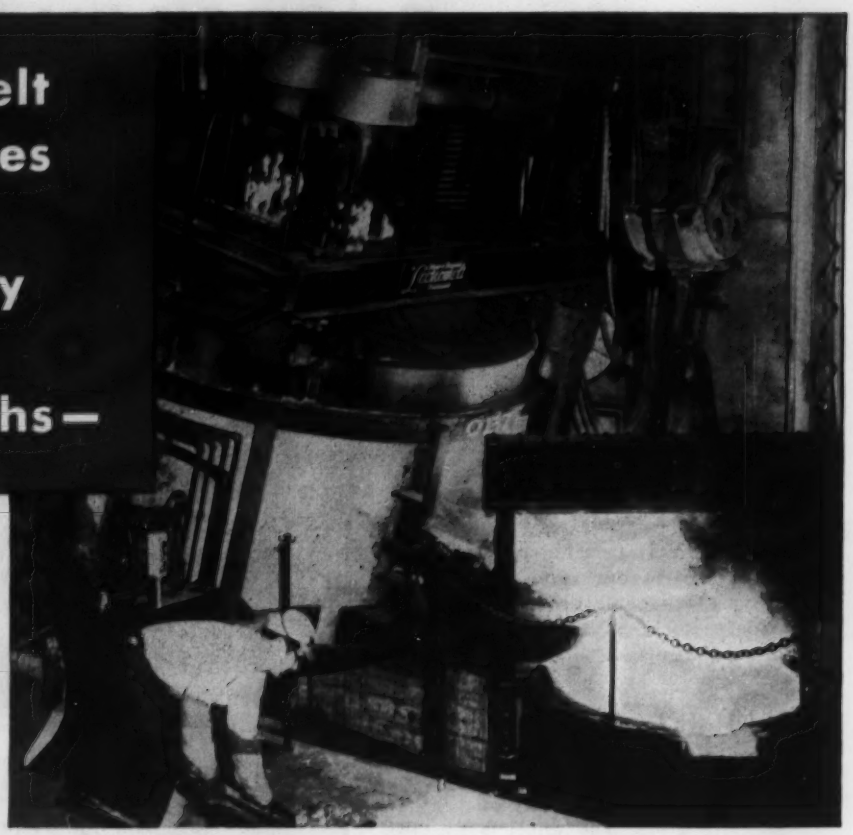
SANDUSKY FOUNDRY and MACHINE CO.

615 W. Market Street Sandusky, Ohio

2 Lectromelt arc furnaces compete successfully with openhearths—

at Manitoba Rolling Mill Co. of Canada . . .



Manitoba Rolling Mill's new OPT Lectromelt is rated at 4½ tons per hour. It is ideally suited for making steel ingots for structurals, rounds and reinforcing bar produced by Manitoba.

Melting carbon steels

There's no question about the high quality of Manitoba Rolling Mill steels. Their two Lectromelt* Furnaces give them power to control temperature and analysis exactly. They meet order specifications easily. And they can duplicate specifications over and over again . . . even if orders require special alloying.

Melting is fast and precise in a Lectromelt Furnace. Down time is minimized because very little maintenance is required. Top-charging saves even more time . . . conserving power, furnace lining, electrodes and labor. What's more, when the workday is over a Lectromelt can lie idle all night without costing a penny.

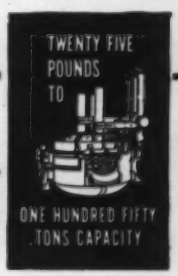
Lectromelt's power supply and power regulation equipment is engineered specifically for each installation, assuring satisfactory operation. For top-charging, the roof lift and swing mechanism is separately mounted. Tilt mechanism is side mounted. Lectromelt's reduced inertia electrode mechanism gives you better control of electrodes.

A new Lectromelt could be your answer to improved plant efficiency. To obtain Lectromelt Furnace Bulletin No. 9, or to discuss the engineering or any characteristic of Lectromelt melting, smelting, refining or reduction furnaces, write Pittsburgh Lectromelt Furnace Corporation, 323 32nd St., Pittsburgh 30, Pa.

Manufactured in . . . GERMANY: Friedrich Kocks GMBH, Dusseldorf . . . ENGLAND: Birlec, Ltd., Birmingham . . . FRANCE: Stein et Roubaix, Paris . . . BELGIUM: S. A. Belge Stein et Roubaix, Bressoux-Liege . . . SPAIN: General Electrica Espanola, Bilbao . . . ITALY: Forni Stein, Genoa. JAPAN: Daido Steel Co., Ltd., Nagoya

*REG. T. M. U. S. PAT. OFF

WHEN YOU MELT... MOORE RAPID *Lectromelt*



NEW Literature

Write directly to the company for a copy

Nodular Iron

Here's information on nodular iron for rolls and castings. Included are qualities, physicals, specifications on different types, plant production illustrations, roll and casting applications—8 pages. Aetna-Standard Engineering Co., Frick Bldg., Pittsburgh 30, Pa.

Industrial Trucks

Specifications for each model in this line of gasoline and electric-powered platform, fork and crane trucks are included in a new bulletin—8 pages. Baker-Raulang Co., 1260 W. 80th St., Cleveland 2, O.

Electrical Connectors

A variety of plugs and receptacles for industrial needs are described and illustrated—12 pages. Dept. J-56, Joy Mfg. Co., Henry W. Oliver Bldg., Pittsburgh 22, Pa.

Insulation Manual

The revised second edition of the "85% Magnesia Insulation Manual" contains an explanation of the chemical and physical properties of this product together with new conductivity, density and fire-resistance data—80 pages. Magnesia Insulation Manufacturers Association, 1317 F St. N.W., Washington 4, D. C.

Aluminum Finishes

A comprehensive description of the ways in which the appearance and performance of aluminum can be changed is presented in "Finishes for Alcoa Aluminum"—48 pages. Aluminum Co. of America, 762 Alcoa Bldg., Pittsburgh 19, Pa.

Stainless Steel Wire

Data of interest to manufacturers of wire products are presented in "Rezistal Stainless Steel Wire." Also included are specifications on stainless steel shape wire—32 pages. Advertising Dept., Crucible Steel Co. of America, P.O. Box 88, Pittsburgh 30, Pa.

Gear Hobs

"Fine-Pitch Hobs" covers the recently announced American standard 20-degree involute fine-pitch system—16 pages. Illinois Tool Works, 2501 N. Keeler Ave., Chicago 39, Ill.

Electromagnets

"The Big Lift for Industry" describes the construction and application of this line of electromagnets, in-

NEW LITERATURE

cluding the latest all-welded one—publication EC-88, 24 pages. Cutler-Hammer Inc., N. 12th St., Milwaukee, Wis.

Overhead Cranes

Complete information is given on top-running double-girder cranes with top-running or under-running trolleys. Capacities range from 2 to 12 tons. Spans go to 60 ft—bulletin T202, 20 pages. Chicago Tramrail Corp., 1330 S. Kostner Ave., Chicago 23, Ill.

Electric Chain Hoist

Here are specifications and prices on the CM Lodestar, an electric chain hoist. It's available in capacities from ⅛ to 1 ton for operation on 115 and 208-220/440 volts—bulletin 158, 12 pages. Chisholm-Moore Hoist Division, Columbus-McKinnon Chain Corp., Tonawanda, N. Y.

Machinery Bulletin

Data are given on high-speed friction saws; a combination shear, punch and coper; vertical, horizontal and universal punches; angle and plate-bending rolls; double-angle, rotary and guillotine shears; combined punch and beam benders and bulldozers—bulletin 100, 6 pages. Kling Bros. Engineering Works, 1320 N. Kostner Ave., Chicago 51, Ill.

Aluminum Forgings

Impact extrusions, press and hand forgings are discussed. Among advantages outlined: Grain control, light weight and ease of machining—12 pages. Harvey Aluminum, 19200 S. Western Ave., Torrance, Calif.

Castings

This wall chart contains complete design and engineering properties of Meehanite castings. It furnishes data on the general engineering, heat, wear and corrosion resistant-type metals—Meehanite Metal Corp., 714 North Ave., New Rochelle, N. Y.

Pickling

"Equipping the Pickle House" describes the use of Monel equipment in the processing of large and small fabricated parts, hollow ware, forgings and castings. Photos and diagrams are included—32 pages. Dept. N, International Nickel Co. Inc., 67 Wall St., New York 5, N. Y.

Plant Facilities

"Your Product" outlines services and facilities offered to users of bolts, control rods, spring clips and forgings. It will be of interest to those who buy, design or specify component parts—38 pages. Dept. PR, Columbus Bolt & Forging Co., Columbus 15, O.

Screw Machine Products

The 1955 Buyers' Guide covers cost increases, design considerations, samples, drawings, grinding, burring, concentricity, plating, heat treating, finishing, inspection, overruns and underruns. Engineering drawings illustrate the guide—National Screw Machine Products Association, 2860 E. 130th St., Cleveland 20, O.

Analytical Instruments

Details on the company's x-ray scanning spectrometer, quantrograph analytical instruments and multi-source excitation unit are offered. Applied Research Laboratories, 3717 Park Place, Glendale 8, Calif.

Welding Process

The performance and applications of the new, consumable-electrode, inert-gas welding process (West-ing-arc) are described in this booklet—B-6525, 7 pages. Westinghouse Electric Corp., P. O. Box 2099, Pittsburgh 30, Pa.

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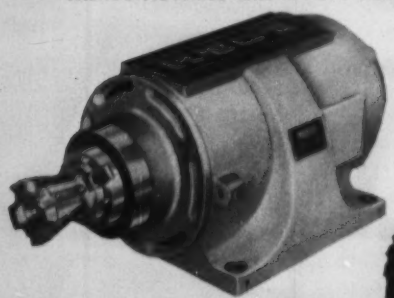
POPE HEAVY DUTY
WHEEL HEAD SPINDLES
With Confidence

POPE Spindles like these are designed for a wide variety of applications including grinding, boring, milling, drilling and many other operations requiring PRECISION COMBINED WITH RUGGEDNESS.

For continuous production and trouble-free operation
THERE'S NOTHING LIKE A POPE SPINDLE WITH ROLLER BEARINGS



◄ P-2565 Heavy Duty, Totally Enclosed, Fan Cooled, Motorized Milling Spindle in sizes from 1 to 30 HP, 600 to 3600 RPM, 220-440 or 550 volts, 3 phase, 60 cycle (other electrical specifications available.)

P-12007 Heavy Duty Belt Driven Milling ► Spindle, in sizes from 1 to 50 HP. Available with standard No. 30, 40, 50 or 60 milling machine noses.

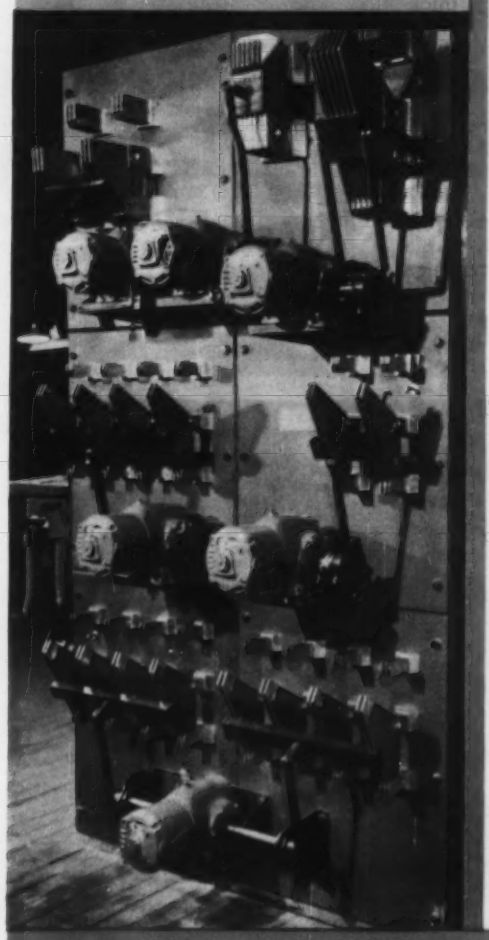
SEND US YOUR SPECIFICATIONS AND LET OUR ENGINEERS RECOMMEND THE SPINDLE FOR THE JOB YOU ARE GOING TO DO

No. 99

Specify POPE PRECISION SPINDLES

POPE MACHINERY CORPORATION
Established 1926
[illegible] RIVER STREET • HAVERHILL, MASSACHUSETTS

Geared for smooth, slow speed



SIX **Century**

Performance-Rated®

GEAR MOTORS

power this remote controlled Automatic Switch. These gear motors are ⅓ H.P., 5 r.p.m., right angle shaft.

Whatever your slow speed needs . . . from 4.3 to 780 r.p.m. . . . Century Gear Motors provide compact, quiet-running units hardly larger than conventional motors . . . in ratings from ⅛ to 150 H. P.

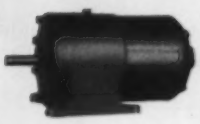
For quiet, dependable service, helical gears with "rotational tooth contact" help prevent uneven wear and minimize vibration. Extra-width pinions provide strength for greater shock load resistance and longer life.

Tapered roller bearings enable the gear shafts to withstand radial and thrust loads without strain on the motor. Oil tight shaft seals make these motors particularly adaptable to shaft-down mountings on processing jobs where contamination is a problem.

Whatever the speed and power characteristics you need . . . AC or DC . . . Century Motors are Performance-Rated to do the job with top efficiency. For information, call your nearby Century Sales Office or Authorized Distributor.

Parallel shaft, single reduction . . . 280 to 780 r.p.m. . . . ⅛ to 150 H.P.

Right angle shaft, single reduction . . . 25 to 280 r.p.m. . . . ⅛ to 3 H.P.



Parallel shaft, double reduction . . . 37 to 280 r.p.m. . . . ⅛ to 150 H.P.

Parallel shaft, triple reduction . . . 7.5 to 37 r.p.m. . . . 1 to 150 H.P.

Right angle shaft, double reduction . . . 4 to 84 r.p.m. . . . ⅛ to ¼ H.P.

Performance-Rated® Motors
⅛ to 400 H.P.

CENTURY ELECTRIC COMPANY

1806 Pine St. • St. Louis 3, Mo. • *Offices and Stock Points in Principal Cities*

Sharp Clean Cuts EVERY TIME

Many thicknesses and sizes of metal are cut on this Steelweld Shear every day. Thanks to Steelweld's exclusive MICRO-SET knife adjustment, it is easy to set the knife clearance to the exact amount which will produce the best cut for every plate run through the machine.

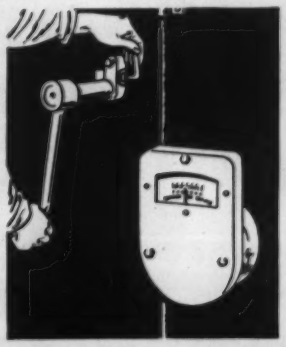
If desired, the knife clearance can be set for an average thickness and all plates cut without changing the clearance. This procedure is used with most shears because to change knife clearance on them is a tedious, difficult operation which usually puts a machine out of service for hours.

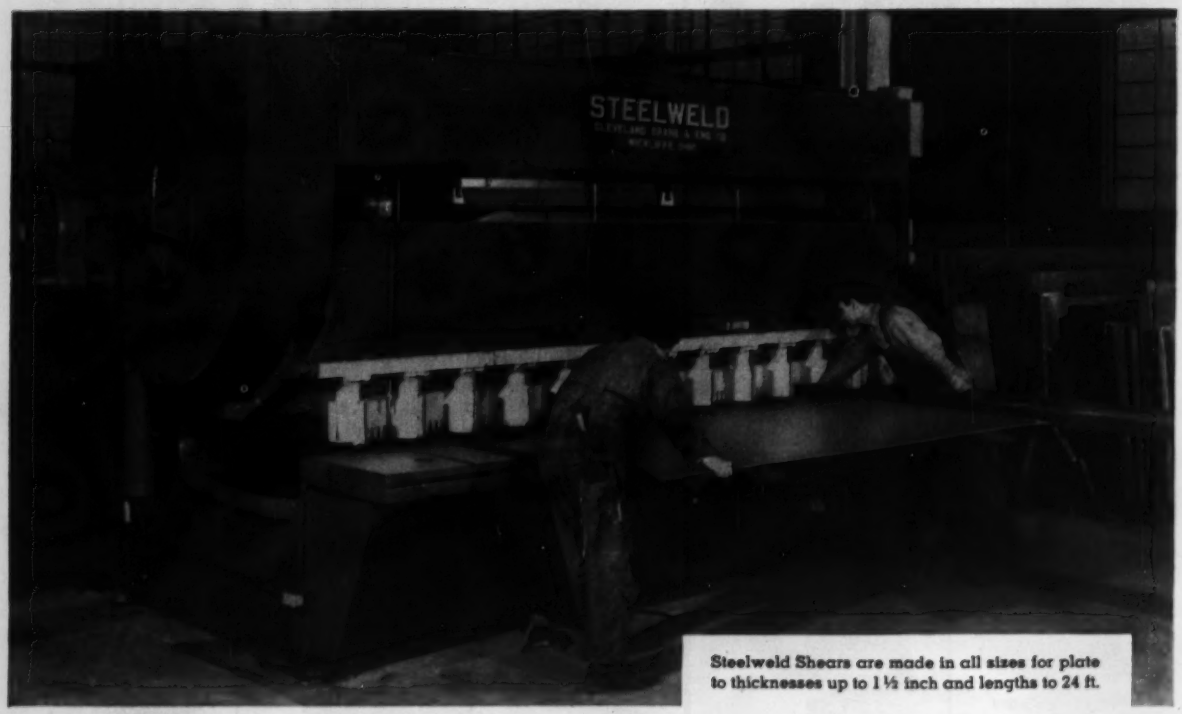
In contrast, knife adjustment on Steelwelds is made in a few seconds. It's simply a matter of turning a crank until an indicator points to the figure representing the thickness of plate being cut. No bolts to loosen; no parts to move. There is no need for using "average" knife settings.

The clutch and brake unit is another outstanding feature of Steelweld Shears. As it is air-operated, it is quick, snappy in action. Its low-inertia design assures cool operation, even after long continuous production runs, because energy to be dissipated is minimized and working pressure necessary on clutch and brake facings is greatly reduced.

The many features of Steelweld Shears make it worth your while to get all the facts.

Because of MICRO-SET Knife Adjustment





Steelweld Shears are made in all sizes for plate to thicknesses up to 1½ inch and lengths to 24 ft.

GET THIS BOOK!

CATALOG No. 2011 gives construction and engineering details. Profusely illustrated.

THE CLEVELAND CRANE & ENGINEERING CO.

7846 East 282nd Street, Wickliffe, Ohio

STEELWELD PIVOTED BLADE SHEARS

Market Outlook

BIG AIM of consumers now is to get delivery of steel scheduled for May and June shipment. They want to beat a price rise.

Steel is billed at prices in effect at time of shipment. With mill order books loaded on some products, there's danger that part of the tonnage scheduled for second-quarter delivery will not get delivered until the third quarter. Early in that period a steel price rise is expected to come as a result of steelworkers' wage negotiations.

STIMULATED—This push for deliveries is strengthening the merchant pig iron business, which for a long while has lacked bounce. Because of slack demand, pig iron prices did not rise last summer when steel prices went up after a wage increase. Since then, iron ore prices have risen, and the iron and steel business has strengthened. Foundries think a price rise on pig iron is a sure thing after the coming wage negotiations.

HEDGING—One group pressing for mill shipments—but not for the same reason as most consumers—is canners. They want tin plate. They are trying to protect themselves against the off-chance of a steelworkers' strike. If it came, it would be near the peak of the fruit and vegetable canning season. Tin plate buyers are protected on price to October. Tin plate is sold on a contract—currently of six month duration.

PUSHING—This push for deliveries, along with continued ordering, is keeping mills near capacity operations. For the third consecutive week, output of steel for ingots and castings in the week ended May 22 was at the record level of 2,328,800 net tons. Mills operated at 96.5 per cent of capacity.

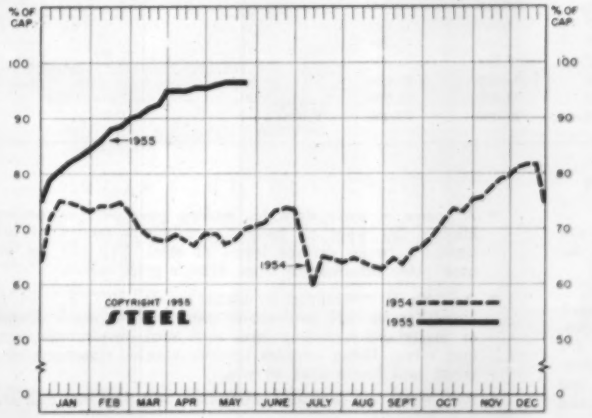
OUTRUNNING PRODUCTION— Mill production of steel is exceeding consumption. So are new orders. Consumers are putting steel into inventory (see STEEL, May 16, p. 147). The inventory-building is inspired by the possible price increase and the improvement in business. Buyers are continuing to order, so they will have a place on mill order books in case the good business continues into the third and fourth quarters of this year.

MOTIVATED BY FEAR—All the demand for steel is not inspired by the high rate of consumption. Fear of reduced production is an incentive for buying the 18-8 grades of stainless steels. Some users of them are afraid a further shortage of nickel (see page 146) may restrict the supply of the nickel-bearing (300 series) stainless steel. Republic Steel Corp., largest producer of stainless, has been losing ground in its nickel inventory since January.

STAINLESS SCRAP UP— The tightening situation in nickel pushed stainless steel scrap prices up again. New York brokers raised their buying prices as much as $25 a ton on the 18-8 grades. The chromium grades (400 series) of stainless scrap went up $5 to $10 a ton.

Scrap for carbon grades of steel remained unchanged after several weeks of decline. STEEL's price composite on steelmaking grades of scrap is $34.83 a gross ton. Also unchanged is STEEL's finished steel price composite at $118.45 a net ton.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended May 22	Change	Same Week 1954	Same Week 1953
Pittsburgh	98	— 1	69.5	99
Chicago	98	— 2.5*	83.5	106
Mid-Atlantic	96	— 0.5	57	97.5
Youngstown	98	0	68	105
Wheeling	95.5	0	82.5	101.5
Cleveland	98.5	— 3.5*	70.5	104.5
Buffalo	104.5	0	67.5	106.5
Birmingham	93.5	0	76	101
New England	88	0	57	85
Cincinnati	91	+ 1.5	59.5	98.5
St. Louis	106	0	72.5	89.5
Detroit	90	+ 1.5	65.5	108
Western	103	+ 3	74.5	109
National Rate	96.5	0	70	100

INGOT PRODUCTION‡

	Week Ended May 22	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	144.7†	146.0	142.2	106.6
NET TONS (In thousands)	2,324†	2,345	2,284	1,712

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,413,278 in 1955; 2,384,549 in 1954; 2,254,459 in 1953.

Metalworking Outlook—p. 51 Technical Outlook—p. 99

Price Indexes and Composites

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	May 17 1956	May 10 1955	Month Ago	Apr. Average
(1947-1949=100)	144.8	144.8	144.8	144.8

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended May 17

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, Standard, No. 1	$4.525	Sheets, Electrical	$9.350
Rails, Light, 40 lb	5.917	Strip, C.R., Carbon	7.493
Tie Plates	5.275	Strip, C.R., Stainless, 430 (lb)	0.415
Axles, Railway	7.500	Strip, H.R., Carbon	5.075
Wheels, Freight Car, 33 in. (per wheel)	48.500	Pipe, Black, Buttweld (100 ft)	15.000
Plates, Carbon	4.675	Pipe, Galv., Buttweld (100 ft)	18.605
Structural Shapes	4.517	Pipe, Line (100 ft)	146.804
Bars, Tool Steel, Carbon (lb)	0.430	Casing, Oil Well, Carbon (100 ft)	154.216
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.525	Casing, Oil Well, Alloy (100 ft)	227.875
Bars, Tool Steel, H.R., Alloy, High Speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.115	Tubes, Boiler (100 ft)	‡
Bars, Tool Steel, H.R., Alloy, High Speed W 18, Cr 4, V 1 (lb)	1.610	Tubing, Mechanical, Carbon	‡
Bars, H.R., Alloy	8.875	Tubing, Mechanical, Stainless, 304 (100 ft)	167.023*
Bars, H.R., Stainless, 303 (lb)	0.423	Tin Plate, Hot-dipped, 1.25 lb	8.533
Bars, H.R., Carbon	5.000	Tin Plate, Electrolytic, 0.25 lb	7.233
Bars, Reinforcing	4.963	Black Plate, Canmaking Quality	6.333
Bars, C.F., Carbon	8.160	Wire, Drawn, Carbon	8.075
Bars, C.F., Alloy	11.375	Wire, Drawn, Stainless, 430 (lb)	0.545
Bars, C.F., Stainless, 302 (lb)	0.438	Bale Ties (bundle)	5.860
Sheets, H.R., Carbon	4.870	Nails, Wire, 8d Common	7.815
Sheets, C.R., Carbon	5.864	Wire, Barbed (80-rod spool)	7.127
Sheets, Galvanized	7.220	Woven Wire Fence (20-rod roll)	16.925
Sheets, C.R., Stainless, 302 (lb)	0.553		

‡Not available. *Not comparable with previous figure.

STEEL's FINISHED STEEL PRICE INDEX*

	May 18 1955	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 avg.=100)	194.53	194.53	194.53	189.74	156.13
Index in cents per lb	5.270	5.270	5.270	5.140	4.230

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT*	$118.45	$118.45	$118.45	$113.70	$93.23
No. 2 Fdry, Pig Iron, GT	56.54	56.54	56.54	56.54	46.47
Basic Pig Iron, GT	56.04	56.04	56.04	56.04	45.97
Malleable Pig Iron, GT	57.27	57.27	57.27	57.27	47.27
Steelmaking Scrap, GT	34.83	34.83	36.08	28.33	33.83

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	May 18 1955	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.30	4.30	4.30	4.15	3.45
Bars, H.R., Chicago	4.30	4.30	4.30	4.15	3.45
Bars, H.R., deld. Philadelphia	4.55	4.55	4.55	4.405	3.93
Bars, C.F., Pittsburgh	5.40	5.40	5.40	5.20	4.10-4.15
Shapes, Std., Pittsburgh	4.25	4.25	4.25	4.10	3.40
Shapes, Std., Chicago	4.25	4.25	4.25	4.10	3.40
Shapes, deld. Philadelphia	4.53	4.53	4.53	4.38	3.42
Plates, Pittsburgh	4.225	4.225	4.225	4.10	3.50
Plates, Chicago	4.225	4.225	4.225	4.10	3.50
Plates, Coatesville, Pa.	4.225	4.225	4.225	4.10	3.60
Plates, Sparrows Point, Md.	4.225	4.225	4.225	4.10	3.50
Plates, Claymont, Del.	4.225	4.225	4.225	4.10	3.60
Sheets, H.R., Pittsburgh	4.05	4.05	4.05	3.925	3.35
Sheets, H.R., Chicago	4.05	4.05	4.05	3.925	3.35
Sheets, C.R., Pittsburgh	4.95	4.95	4.95	4.775	4.10
Sheets, C.R., Chicago	4.95	4.95	4.95	4.775	4.10
Sheets, C.R., Detroit	5.10	5.10	5.10	4.975	4.30
Sheets, Galv., Pittsburgh	5.45	5.45	5.45	5.275	4.40
Strip, H.R., Pittsburgh	4.05	4.05	4.05	4.425	3.25
Strip, H.R., Chicago	4.05	4.05	4.05	3.925	3.25
Strip, C.R., Pittsburgh	5.75	5.75	5.75	5.45	4.15
Strip, C.R., Chicago	5.85	5.85	5.85	5.70	4.30
Strip, C.R., Detroit	5.90	5.90	5.90	5.65	4.35-.40
Wire, Basic, Pittsburgh	5.75	5.75	5.75	5.525	4.50
Nails, Wire, Pittsburgh	6.85	6.85	6.85	6.55	5.30
Tin Plate (1.50 lb), box, Pitts.	$9.05	$9.05	$9.05	$8.95	$7.50

SEMIFINISHED STEEL					
Billets, Forging, Pitts. (NT)	$78.00	$78.00	$78.00	$75.50	$63.00
Wire Rods, 7/32-9/16" Pitts.	4.675	4.675	4.675	4.525	3.85

PIG IRON, Gross Ton					
Bessemer, Pitts.	$57.00	$57.00	$57.00	$57.00	$47.00
Basic, Valley	56.00	56.00	56.00	56.00	46.00
Basic, deld. Phila.	59.66	59.66	59.66	59.66	49.44
No. 2 Fdry, Pitts.	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Valley	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, deld. Phila.	55.16	55.16	55.16	60.16	49.94
No. 2 Fdry, Birm.	52.88	52.88	52.88	52.88	42.38
No. 2 Fdry (Birm.) deld. Cin.	60.58	60.58	60.58	60.43	49.08
Malleable, Valley	56.50	56.50	56.50	56.50	46.50
Malleable, Chicago	56.50	56.50	56.50	56.50	46.50
Ferromanganese, Duquesne	190.00†	190.00†	190.00†	200.00†	175.00*

*75-82% Mn, gross ton, Etna, Pa. †74-76% Mn, net ton.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pitts.	$34.50	$34.50	$35.50	$30.50	$38.00
No. 1 Heavy Melt, E. Pa.	36.00	36.00	37.75	23.00	29.00
No. 1 Heavy Melt, Chicago	34.00	34.00	35.00	31.50	34.50
No. 1 Heavy Melt, Valley	34.50	34.50	35.50	29.50	37.75
No. 1 Heavy Melt, Cleve.	31.50	31.50	33.50	28.50	34.25
No. 1 Heavy Melt, Buffalo	30.50	30.50	32.50	25.50	31.75
Rails, Rerolling, Chicago	51.50	52.50	52.50	42.00	48.50
No. 1 Cast, Chicago	40.50	40.50	41.50	38.50	42.50

COKE, Net Ton					
Beehive, Furn, Connlsvl.	$13.75	$13.75	$13.75	$14.75	$14.25
Beehive, Fdry, Connlsvl.	16.75	16.75	16.75	16.75	16.00
Oven, Fdry, Chicago	24.50	24.50	24.50	24.50	21.00

Daily Nonferrous Price Record

	Price May 18	Last Change	Previous Price	Apr. Avg.	Mar. Avg.	May 1954 Avg.
Copper	36.00	Mar. 29, 1955	33.00	36.000	33.222	30.000
Lead	14.80	Oct. 4, 1954	14.55	14.800	14.800	13.800
Zinc	12.00	Apr. 6, 1955	11.50	11.927	11.500	10.290
Tin	91.50	May 18, 1955	91.375	91.458	87.194	93.600
Nickel	64.50	Nov. 24, 1954	60.00	64.500	64.500	60.000
Aluminum	23.20	Jan. 12, 1955	22.20	23.200	23.200	21.500
Magnesium	28.50	Mar. 21, 1955	27.00	28.500	27.556	27.000

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary ingots, 99+%, deld.; MAGNESIUM, 99.8%, Freeport, Tex.

What You Can Use the Markets Section for:

- **A source of price information.**
  Current prices are reported each week. Price changes are shown in italics. Price trends are shown in tables of indexes and comparisons.
- **A directory of producing points.**
  Want to know who makes something, or where it is made? The steel price tables alphabetically list the cities of production and indicate the producing company. If you are a buyer, you may want to make a map showing comparative distances of sources of supply and to help you compute freight costs. If you are a seller of supplies you can make a map to spot your sales possibilities.
- **A source of price data for making your own comparisons.**
  Maybe you want to keep a continuous record of price spread between various forms of steel. You can get your base price information from STEEL's price tables.
- **A source of information on market trends.**
  Newsy items tell you about the supply-demand situation of materials, including iron and steel, nonferrous metals and scrap. Other articles analyze special situations of interest and importance to you.
- **Reports on iron and steel production, and materials and product shipments.**

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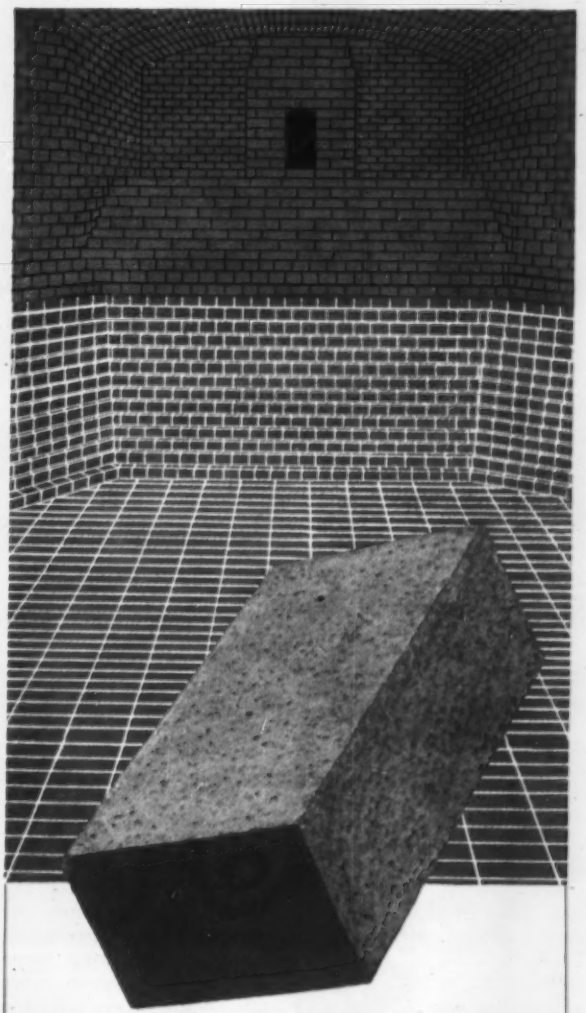

Kaiser PERICLASE Brick for the Steel Industry:

Periclase "D-S" burned brick for open hearth and electric furnace bottoms. Low in iron, lime and silica. Chrome free. Maximum MgO in bottom.

Periclase-Chrome "A," plain and metal-encased for open hearth and walls, front walls and uptakes. Metal-encased for electric furnace sidewalls. High in MgO. Outstanding all-purpose refractory.

Chrome-Periclase "A," plain and metal-encased for open hearth back walls, front walls.

1. **High MgO**
2. **Chromite-free**
3. **Low iron-oxide**
4. **Low calcium oxide**
5. **Maximum density; low permeability**
6. **Slag resistance**
7. **Great volume stability**
8. **Clean edges; accurate dimensions**

All of these eight properties—outlined by major steel company ceramists as most desirable for sub-hearth brick—are found in Kaiser Periclase D-S Brick.

This superior brick has been *designed especially* to withstand sub-hearth conditions—thus gives maximum protection against costly breakthroughs, gives longer sub-hearth life.

High MgO (more than 95%) is achieved through the use of pre-shrunk, accurately-sized Periclase grains derived from sea-water magnesia. Absence of chromite eliminates the reduction of chromium oxide when the sub-hearth may be in contact with the bath or when carbon monoxide penetrates to the sub-hearth.

Low iron oxide minimizes refractory damage through alternate oxidation and reduction of iron oxide and other iron compounds. Low calcium prevents damage caused by slaking during slow heat-ups or while furnace is idle.

With all its many advantages, Kaiser Periclase D-S Brick gives you the ultimate in sub-hearth safety and durability—*yet costs no more!*

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Nonferrous Metals

Nondefense nickel users may soon see the dawn of a better day. If government sets precedent in June with increased stockpile deferment, third quarter could get similar action

Nonferrous Metal Prices, Pages 148 & 149

WASHINGTON has been turning a sympathetic ear toward the nickel industry. Unless something unexpected happens, there will be more civilian nickel available in June than in many a month. The "unexpected" would be the failure of Defense Mobilizer Arthur Flemming to defer from stockpile delivery more than the 1 million lb extra metal previously promised for nondefense users next month. Three million lb has been the most frequently mentioned figure.

At presstime, some such action looked like a good bet although the Office of Defense Mobilization had neither confirmed nor denied the rumor. There is plenty of basis for release of more nickel. Since the beginning of the year, nickel users have been told that defense requirements in 1955 were to be lower than in 1954, which, in turn, were lower than in 1953. This would mean more metal for nondefense uses. But that extra metal never materialized. Military demands got heavier instead of lighter. One source close to the situation says that on the basis of the first five months of 1955, defense needs this year may be 8 to 9 per cent greater than last year's.

Friends of Industry—Sentiment for the civilian industry has been building up within governmental agencies. The Business & Defense Services Administration is definitely friendly to civilian users of nickel. In recent months ODM has tended to side with them. Definite proof of this attitude was the release of 1 million lb of extra metal per month for February through June.

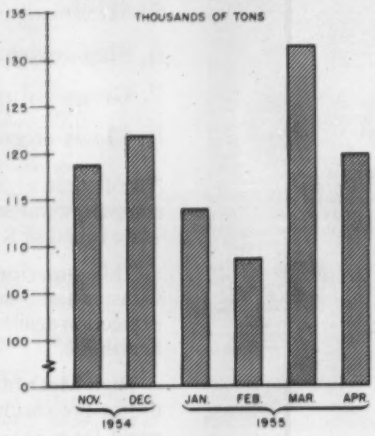
This represented an almost complete turnabout in ODM's policy. Previously, first and last consideration had been to build up the stockpile. Upon re-evaluation, the stockpile position evidently was found more satisfactory than was expected, resulting in some consideration for nondefense users. With demands from both segments of the industry on the upgrade, the additional release rumored for June is then a logical extension of the policy adopted for the February-to-June period.

Just in Time—The help, if it comes, will not be too soon for the industry, either. One spokesman indicates that inventories of nickel dropped at the rate of 1 million lb a month in January and February and even more in March and April. The depletion is continuing in May. Inventories soon will reach the two or three-week level, if they already haven't. L. S. Hamaker, general manager of sales of Republic Steel Corp., Cleveland, one of the biggest users of nickel, says his company has been losing its inventory position steadily since January. This situation is the result of an increase in business in 1955 while the civilian metal supply stays at about the 1954 level.

If the government does increase its help to 3 million lb—or any other figure over 1 million—in June, industry can look forward to better nickel days. It is reported that a meeting of governmental planners would be held in late June or early July to appraise the following months in the light of labor conditions as they exist then. Many observers feel at least 1 million lb a month will be continued into third quarter for sure. If there is no major strike on the horizon and if business looks like it will continue at fairly high levels, it's a good bet that more than that will be released.

Not Permanent Dole—Defense Mobilizer Flemming has let it be known that he will not continue diversions from stockpile indefinitely. But as one nickel man said with a smile: "Things look better now for the nickel industry than they have for a long, long time."

COPPER DELIVERIES:
No Relief for Fabricators



Source, Copper Institute.

Copper Coming Into Focus

Copper comes into a little sharper focus as the second half draws near. Most encouragement is drawn from the fact that consumers who are really hard up for the red metal will be able to get some relief from the General Services Administration. The Office of Defense Mobilization has ordered GSA to release 16,000 tons of stockpile-destined copper to hardship cases certified by the Department of Commerce. This is a continuation of the policy that was established during the early stages of the present copper shortage. Deferment of the stockpile shipments will be until June 30, 1956.

But even with such deferments, copper users aren't getting enough metal to satisfy demands. April figures from the Copper Institute show that deliveries to fabricators, including tonnages delivered from governmental stockpile, were only 119,863 tons, or a decrease of 11,491 tons from March. Even considering that April had one less day, the daily rate dropped by over 300 tons. U. S. production of primary copper for April compared favorably with the preceding month.

Aluminum Water Troubles Ease

Last Friday, aluminum producers met with Business & Defense Services Administration officials to request deferral of shipments of the light metal to stockpile during the third quarter. Water shortages usually plague production during those months. At present, however, water is the least of the worries in the Pacific Northwest. Latest reports are of improved stream flow and better weather conditions which have enabled the Bonneville Power Administration for the first time in two months to meet all demands of aluminum producers for electric power. This should help in setting new production records. March is still top month for primary production, April having fallen short by about 8 million lb.

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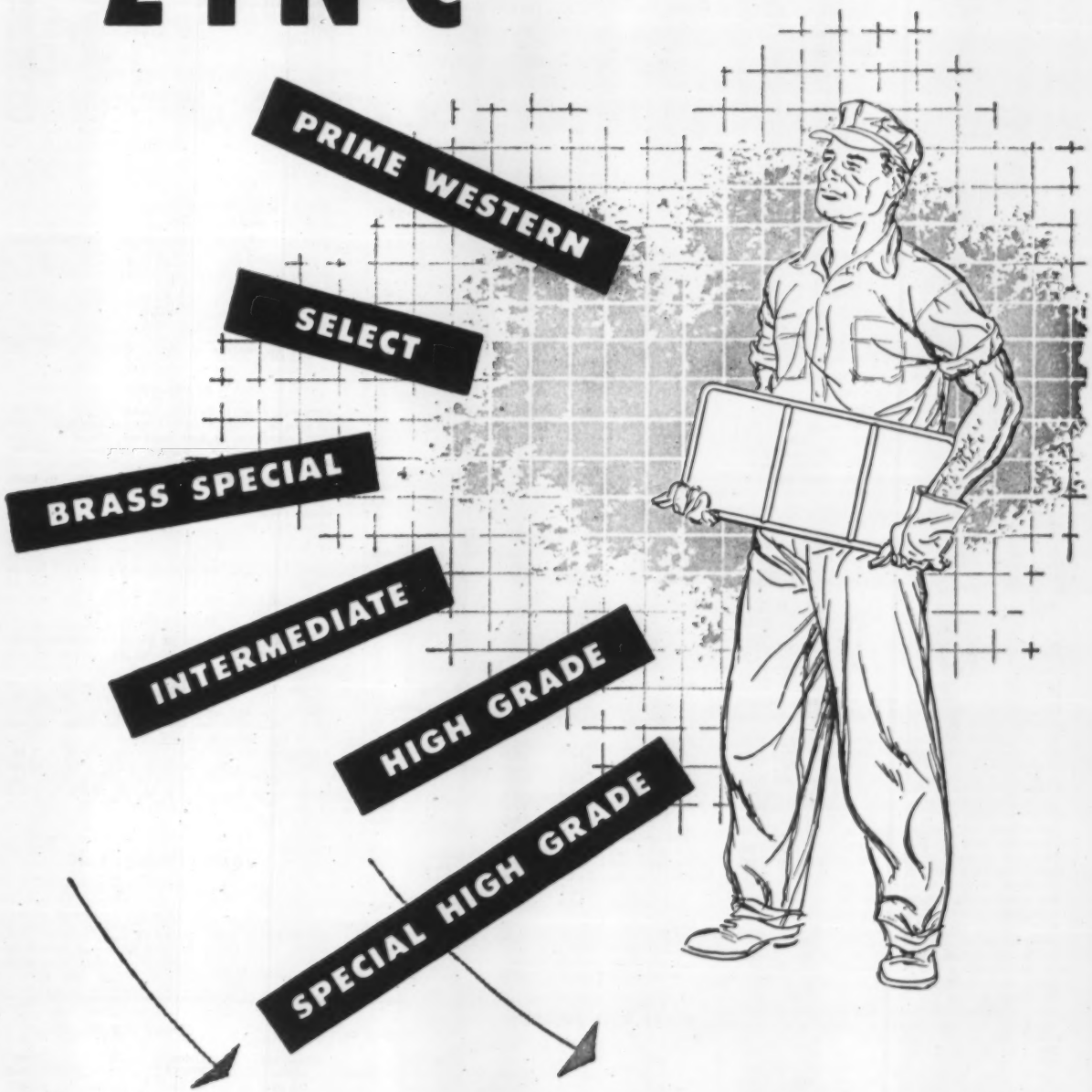

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Nonferrous Metals

Cents per pound, carlots, except as otherwise noted

PRIMARY METALS AND ALLOYS

Aluminum: 99 + %, ingots 23.20, pigs 21.50, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 12, 12% Si, 25.00; No. 43, 5% Si, 24.80; No. 142, 4% Cu, 1.5% Mg, 2% Ni, 26.50; No. 195, 4.5% Cu, 0.8% Si, 25.90; No. 214, 3.8% Mg, 26.40; No. 356, 7% Si, 0.3% Mg, 24.90.

Antimony: R.M.M. brand, 99.5%, 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.00-28.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa., Elmore, O.

Beryllium Copper: 3.75-4.25% Be, $40 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa., or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb, deld.

Cobalt: 97-99%, $2.60 per lb for 550-lb keg; $2.62 per lb for 100-lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $119.20 per lb, nom.

Copper: Electrolytic 36.00 deld. Conn. Valley; 36.00 deld. Midwest; Lake 36.00 deld; Fire refined 35.75 deld.

Germanium: 99.9%, $295 per lb, nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $90-$120 nom. per troy oz.

Lead: Common 14.80, chemical 14.90, corroding 14.90, St. Louis; N. Y. basis, add 0.20.

Lithium: 99 + %, $13-$18, f.o.b. Minneapolis, depending on quantity and form. For rod, add $2 a lb; for wire, add $3 a lb.

Magnesium: 99.8%, self-pailetizing pig 28.50; notched ingot 29.25, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., add 1.40 for pig and 1.45 for ingot; for Madison, Ill., add 1.20 for pig and 1.25 for ingot; for Los Angeles, add 2.50 for both pig and ingot. Sticks 1.3 in. diameter, 49.00, 100 to 4999 lb, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, H, G and R 34.00; alloy M 36.00, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., add 1.40; for Madison, Ill., add 0.50; for Los Angeles, add 2.50

Mercury: Open market, spot, New York, $308-$310 per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced $3-$3.25 per lb; pressed ingot $4.06 per lb; sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked 64.50; 10-lb pigs, unpacked 67.65; "XX" nickel shot 69.00; "F" nickel shot or ingots for addition to cast iron, 64.50; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: $120-$130, nom., per troy oz.

Palladium: $17-$20 per troy oz.

Platinum: $76-$80 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $118-$125 per troy oz.

Ruthenium: $45-$56 per troy oz.

Selenium: 99.5%, $6-$7.25 per lb.

Silver: Open market, 89.75 per troy oz.

Sodium: 16.50, c.l.; 17.00 l.c.l.

Tantalum: Sheet, rod $68.70 per lb; powder $56.63 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot and prompt, 91.50.

Titanium: Sponge, 99.3+ %, grade A-1 ductile (0.3% Fe max) $3.95, grade A-2 (0.5% Fe max) $3.50 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots $4.35-$4.40 per lb, nom., f.o.b. shipping point; less than 1000 lb add 15.00; 99 + % hydrogen reduced, $4.65. Treated ingots, $6.70.

Zinc: Prime Western, 12.00; brass special, 12.25; intermediate, 12.50, E. St. Louis, freight allowed over 0.50 per pound. High grade, 13.35; special high grade, 13.50. Diecasting alloy ingot No. 3 16.00; Nos. 2 and 5, 16.50.

Zirconium: Ingots, commercial grade, $14.40 per lb; low-hafnium reactor grade, $23.07. Sponge, $7.50 per lb. Powder, electronics grade, $15 per lb; flash grade, $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston Alloy, 26.75-28.00; No. 12 foundry alloy (No. 2 grade), 26.00-26.50; 5% silicon alloy, 0.60 Cu max, 27.75-28.25; 13 alloy, 0.60 Cu max, 27.75-28.25; 195 alloy, 27.75-28.25; 108 alloy, 26.50-26.75. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 27.00-27.25; grade 2, 26.00-26.25; grade 3, 25.00-25.25; grade 4, 24.50-24.75.

Brass Ingot: Red brass No. 115, 35.50; tin bronze No. 225, 47.50; No. 245, 40.75; high-leaded tin bronze No. 305, 39.00, No. 1 yellow, No. 405, 30.75; manganese bronze No. 421, 33.25.

Magnesium Alloy Ingot: AZ63A, 31.00; AZ91B, 26.00; AZ91B, 31.00; AZ92A, 31.00.

NONFERROUS MILL PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb, f.o.b. Temple, Pa.; nominal 1.9% Be alloy) Strip, $1.74; rod, bar, wire, $1.71.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000-lb lots, 41.35; 30,000-lb lots, 41.48; l.c.l., 41.98. Weatherproof, 100,000-lb, 40.78; 30,000 lb, 41.03; l.c.l., 41.53. Magnet wire deld., 15,000 lb or more, 48.15; l.c.l., 48.90.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets, full rolls, 140 sq ft or more $20 per cwt; pipe, full coils $20 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forging billets, $9; hot-rolled and forged bars, $9.

ZINC

(Prices per lb, c.l., f.o.b. mill) Sheets, 23.00; ribbon zinc in coils, 19.50-20.50; plates, 18.50-22.25.

ZIRCONIUM

Plate, $22; H.R. strip, $19; C.R. strip, $29; forged or H.R. bars, $17; wire, 0.015 in., 1.00c per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheet, C.R.	102	78	99
Strip, C.R.	102	87	125
Plate, H.R.	97	83	95
Rod, Shapes H.R.	87	69	93
Rod, Shapes C.R.	91	75	115
Seamless Tubes	122	108	153
Shot, Blocks		65	

ALUMINUM

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	63.5	62.0	...	...
0.156-0.172	53.9	52.3	...	...
0.188	53.9	52.3	...	66.8
0.219-0.234	51.1	49.5	...	...
0.250-0.281	51.1	49.5	...	63.7
0.313	51.1	49.5	...	60.8
Cold-finished				
0.375-0.547	49.9	47.5	59.8	57.2
0.563-0.688	49.9	47.5	56.9	53.7
0.750-1.000	48.7	46.3	52.1	50.6
1.063	48.7	46.3	...	48.9
1.125-1.500	46.9	44.6	50.4	48.9
Rolled				
1.563	45.7	43.4	...	...
1.625-2.000	45.1	42.8	...	47.2
2.125-2.500	44.0	41.7	...	...
2.563-3.375	42.7	40.5	...	...

ALUMINUM

Sheets and Circles: 1100 and 3003 mill finish (30,000 lb base; freight allowed over 499 lb)

Thickness Range Inches	Flat Sheet	Flat Sheet Circles*	Coiled Sheet	Coiled Sheet Circles†
0.249-0.136	35.9	40.4	...	...
0.135-0.096	36.4	41.2	...	...
0.095-0.077	37.1	42.2	34.6	39.6
0.076-0.061	37.7	43.2	34.8	39.8
0.060-0.048	38.2	43.6	35.1	40.2
0.047-0.038	38.7	44.5	35.6	40.6
0.037-0.030	39.1	45.0	36.0	41.2
0.029-0.024	39.7	45.5	36.3	41.8
0.023-0.019	40.4	46.9	37.1	42.6
0.018-0.017	41.2	...	37.7	43.5
0.016-0.015	42.1	...	38.5	44.7
0.014	43.1	...	39.5	46.0
0.013-0.012	44.3	...	40.2	47.0
0.011	45.3	...	41.4	48.6
0.010-0.0095	46.5	...	42.5	50.2
0.009-0.0085	47.8	...	44.0	52.3
0.008-0.0075	49.4	...	45.2	54.1
0.007	50.9	...	46.7	56.4
0.006	52.5	...	48.1	61.4

*48 in. max diam. †26 in. max diam.

ALUMINUM

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam, 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	34.6	38.8
5050-F	35.7	39.9
3004-F	36.7	41.6
5052-F	38.4	43.4
6061-T6	39.6	44.0
2024-T4*	41.8	47.9
7075-T6*	49.6	56.2

*24-48 in. widths or diam, 72-180 in. lengths

ALUMINUM

Forging Stock: Round, Class 1, 47.80-37.30, in specific lengths 36-144 in., diameters 0.375-8 in. Rectangles and squares, Class 1, 53.60-41.00 in random lengths, 0.375-4 in. thick, widths 0.750-10 in.

Pipe: A.S.A. Schedule 40, alloy 6063-T6, 20-ft lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
¾	$16.10	2	$ 49.50
1	25.35	4	136.65
1¼	34.30	6	244.90
1½	41.00	8	368.50

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 97.00, 0.064-in. 76.00, 0.125-in. 61.50, 30,000 lb and over, f.o.b. mill.

Plate: Hot-rolled AZ31, 59.00, 30,000 lb or more, 0.250 in. and over, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 62.00, 30,000 lb or more, ¼-in. thick, widths 24-72 in., lengths 60-192 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in., 72.20; 1 x 4 in., 67.00. Rod, 1 in., 69.00; 2 in., 66.50. Tubing, 1 in. OD x 0.065 in., 90.00. Angles, 1 x 1 x ⅛-in., 75.90; 2 x 2 x ⅛-in., 70.00. Channels, 5 in., 70.90. I-beams, 5 in., 70.20.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 1100 clippings, 13.50-14.00; old sheet, 11.00-11.50; borings and turnings, 7.50-8.00; crankcases, 11.00-11.50; industrial castings, 11.00-11.50.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	54.76b	52.36c	....	54.82	32 000	32 000	31.250
Yellow Brass	46.27	46.21d	46.81	49.18	23.875	23.625	22.000
Red Brass, 85%	50.99	50.93	51.53	53.80	28.125	27.875	27.375
Low Brass, 80%	49.75	49.69	50.29	52.56	27.000	26.750	26.750
Naval Brass	49.99	44.30	57.05	53.15	22.125	21.875	21.375
Com. Bronze, 90%	52.78	52.72	53.32	55.34	29.250	29.000	28.500
Nickel Silver, 10%	60.20	62.53g	62.53	....	27.625	27.375	13.813
Phos. Bronze, A, 5%	73.03	73.53	73.53	74.71	32.250	32.000	31.000
Silicon Bronze	58.82	58.01	58.84	60.80e	31.125	30.875	30.125
Manganese Bronze	53.73	47.83	58.24	....	22.125	21.875	21.375
Munts Metal	48.14	43.95	....	....	22.375	22.125	21.625

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

Copper and Brass: No. 1 heavy copper and wire, 30.00-31.00; No. 2 copper, 29.00-29.50; light copper, 27.00-27.50; No. 1 composition red brass, 24.50-25.00; No. 1 composition turnings, 24.00-24.50; yellow brass turnings, 15.00; new brass clippings, 21.50-22.00; No. 1 brass rod turnings, 19.50-20.00; light brass, 15.50-16.50; heavy yellow brass, 16.50-18.00; new brass rod ends, 20.50-21.00; auto radiators, unsweated, 18.00-18.50; cocks and faucets, 19.50-20.50; brass pipe, 19.50-20.50.
Lead: Heavy, 11.50-11.75; battery plate, 6.00-6.75; linotype and stereotype, 13.50-14.25; electrotype, 12.00-12.50; mixed babbitt, 12.00-14.00.
Magnesium: Clippings 18.50-19.50; clean castings 18.00-19.00; iron castings, not over 10% removable Fe, less full deduction for Fe, 16.00-17.00.
Monel: Clippings, 28.00-36.00; old sheets, 26.00-32.00; turnings, 21.00; rods, 28.00-36.00.
Nickel: Sheets and clips 57.00-70.00; rolled anodes 57.00-70.00; turnings 40.00-55.00; rod ends 57.00-70.00.
Tin: No. 1 pewter 50.00-59.00; block tin pipe 75.00-77.00; No. 1 babbitt 45.00-48.00.
Zinc: Old zinc 4.50-5.00; new die cast scrap 4.75-5.00; old die cast scrap 3.25-3.50.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)
Aluminum: 1100 clippings, 17.50-18.50; 3003 clippings, 17.50-18.50; 6151 clippings, 17.50-18.50; 5052 clippings, 17.50-18.50; 2014 clippings, 17.00-18.00; 2017 clippings, 17.00-18.00; 2024 clippings, 17.00-18.00; mixed clippings, 17.00-18.00; old sheet, 14.50-16.50; old cast, 14.50-16.50; clean old cable (free of steel), 17.50-18.50; borings and turnings, 15.50-17.00.
Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 48.00; light scrap 43.00.
Copper and Brass: No. 1 copper, 34.00; No. 2 copper, 32.50; light copper, 30.75; refinery brass (60% copper) per dry copper content, 30.00.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)
Copper and Brass: No. 1 copper, 33.50-34.00; No. 2 copper, 32.00-32.50; light copper, 30.25-30.75; No. 1 composition borings, 26.50; No. 1 composition solids, 27.00; heavy yellow brass solids, 20.25; yellow brass turnings, 19.50-20.50; radiators, 21.00.

PLATING MATERIAL

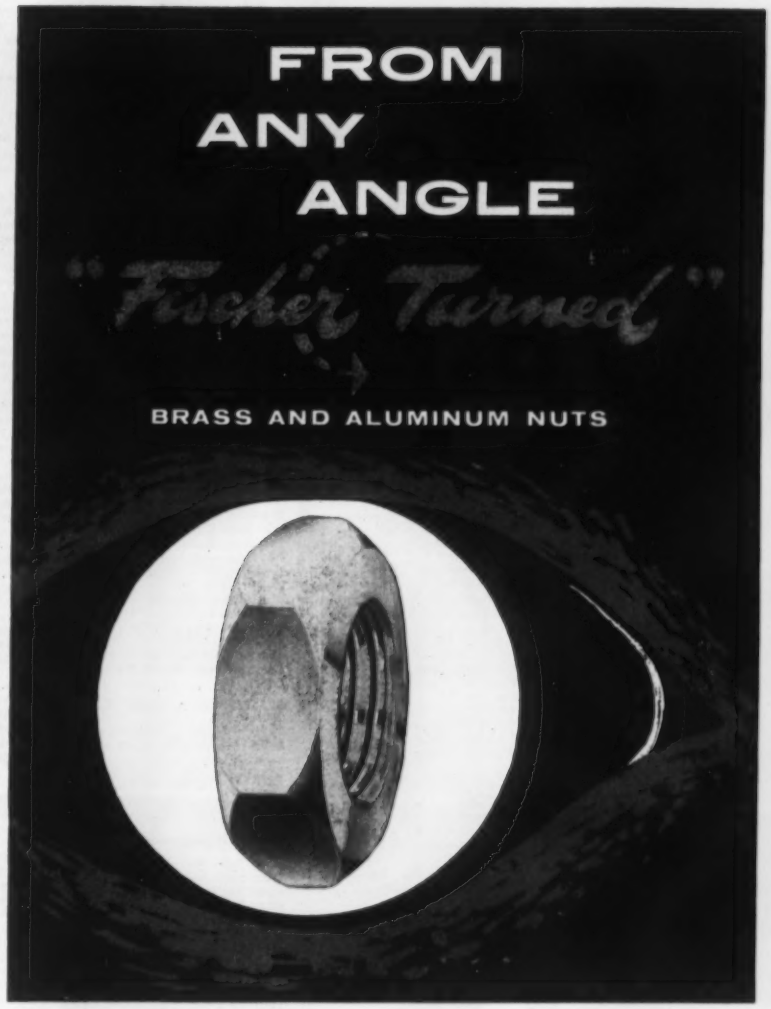
(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $1.70 per lb.
Copper: Flat-rolled 51.42, oval 50.92, 5000-10,000 lb; electrodeposited 49.40, 2000-5000 lb lots; cast 50.54, 5000-10,000 lb quantities.
Nickel: Depolarized, less than 100 lb $1.015; 100-499 lb 99.50; 500-4999 lb 95.50; 5000-29,999 lb 93.50; 30,000 lb 91.50. Carbonized, deduct 3 cents a lb. All prices eastern delivery effective Jan. 1, 1955.
Tin: Bar or slab, less than 200 lb, $1.095; 200-499 lb, $1.08; 500-999 lb, $1.075; 1000 lb or more, $1.07.
Zinc: Bar 20.00, bar or flat top 19.00, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100-lb drums.
Chromic Acid: Less than 10,000 lb 28.50; over 10,000 lb 27.50.
Copper Cyanide: 100 lb 76.80; 200 lb 76.05; 300 lb 75.80; 400-900 lb 75.05; 1000 lb and over 73.05; effective Mar. 24, 1955.
Copper Sulphate: Crystal, 100 lb 21.50; 200 lb 18.50; 300 lb 17.50; 400 lb 17.00; 500-1900 lb 15.50; 2000-10,000 lb 15.25; 10,000 lb and up 15.15. Powder, add 0.5 to above prices. Effective Mar. 29, 1955.
Nickel Chloride: 100 lb 46.50; 200 lb 44.50; 300 lb 43.50; 400-4900 lb 41.50; 5000-9900 lb 39.50; 10,000 lb and over 38.50. All prices eastern delivery, effective Jan. 1, 1955.
Nickel Sulphate: 100 lb 38.25; 200 lb 36.25; 300 lb 35.25; 400-4900 lb 33.25; 5000-35,900 lb 31.25; 36,000 lb 30.25. All prices eastern delivery, effective Jan. 1, 1955.
Silver Cyanide: (Cents per ounce) 4-oz bottle, 83.125; 16-oz bottle, 81.875; 80-oz bottle, 79.375; 100-oz bottle, 79.375; f.o.b. St. Louis, New York and Los Angeles. Effective Apr. 6, 1955.
Sodium Cyanide: Egg, under 1000 lb 19.80; 1000-19,900 lb 18.80; 20,000 lb and over 17.80; granular, add 1-cent premium to above.
Sodium Stannate: Less than 100 lb, 70.10; 100-600 lb, 55.90; 700-1900 lb, 53.40; 2000-9900 lb, 51.70; 10,000 lb or more, 50.60.
Stannous Chloride (Anhydrous): Less than 50 lb, $1.558; 50 lb, $1.218; 100-300 lb, $1.068; 400-900 lb, $1.043; 1000-1900 lb, $1.019; 2000-4900 lb, 98.20; 5000-19,900 lb, 92.10; 20,000 lb or more, 86.00.
Stannous Sulphate: Less than 50 lb, $1.258; 50 lb, 95.80; 100-1900 lb, 93.80; 2000 lb or more, 91.80.
Zinc Cyanide: Under 1000 lb 54.30; 1000 lb and over 52.30.



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Standard or "specials", Fischer *turned* nuts cost no more than those produced by other, less accurate methods, yet each is burrless . . . tapped square with the face to Class 2 tolerances . . . cleaned and degreased . . . countersunk on both sides.

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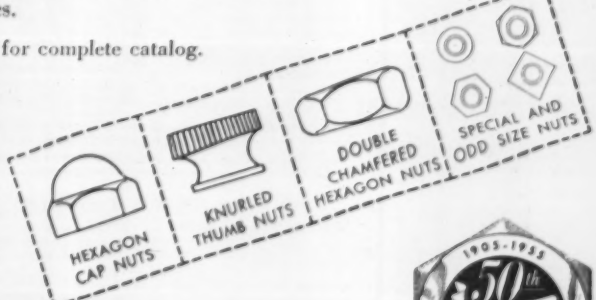


Fischer SPECIAL MFG. CO.
476 Morgan St. • Cincinnati 6, Ohio

1905-1955 50th ANNIVERSARY FISCHER SPECIAL MFG. CO. CINCINNATI, OHIO

C-234-FS

Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company. Key on page 151. Key to footnotes, page 153.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 ....$61.50

INGOTS, Alloy (NT)
Detroit R7 ....$65.00
Houston S5 ....70.00
Midland,Pa. C18 ....65.00
Munhall,Pa. U5 ....65.00

BILLETS, BLOOMS & SLABS Carbon, Rerolling (NT)
Aliquippa,Pa. J5 ....$64.00
Bessemer,Pa. U5 ....64.00
Bridgeport,Conn. N19 ..69.00
Buffalo R2 ....64.00
Clairton,Pa. U5 ....64.00
Ensley,Ala. T2 ....64.00
Fairfield,Ala. T2 ....64.00
Fontana,Calif. K1 ....72.00
Gary,Ind. U5 ....64.00
Johnstown,Pa. B2 ....64.00
Lackawanna,N.Y. B2 ..64.00
LoneStar,Tex. L6 ....70.00
Munhall,Pa. U5 ....64.00
Pittsburgh J5 ....64.00
So.Chicago,Ill. R2, U5..64.00
So.Duquesne,Pa. U5 ..64.00
Youngstown R2 ....64.00

Carbon, Forging (NT)
Aliquippa,Pa. J5 ....$78.00
Bessemer,Pa. U5 ....78.00
Bridgeport,Conn. N19 ..83.00
Buffalo R2 ....78.00
Canton,O. R2 ....80.00
Clairton,Pa. U5 ....78.00
Conshohocken,Pa. A3 ..83.00
Ensley,Ala. T2 ....78.00
Fairfield,Ala. T2 ....78.00
Fontana,Calif. K1 ....86.00
Gary,Ind. U5 ....78.00
Geneva,Utah C11 ....78.00
Houston S5 ....83.00
Johnstown,Pa. B2 ....78.00
Lackawanna,N.Y. B2 ..78.00
LosAngeles B3 ....87.50
Midland,Pa. C18 ....78.00
Munhall,Pa. U5 ....78.00
Pittsburgh J5 ....78.00
Seattle B3 ....91.50
So.Chicago R2,U5,W14..78.00
So.Duquesne,Pa. U5 ..78.00
So.SanFrancisco B3 ...87.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$86.00
Buffalo R2 ....86.00
Canton,O. R2, T7 ....86.00
Conshohocken,Pa. A3 ..93.00
Detroit R7 ....86.00
Fontana,Calif. K1 ....105.00
Gary,Ind. U5 ....86.00
Houston S5 ....91.00
Ind.Harbor,Ind. Y1 ...86.00
Johnstown,Pa. B2 ....86.00
Lackawanna,N.Y. B2 ..86.00
LosAngeles B3 ....106.00
Massillon,O. R2 ....86.00
Midland,Pa. C18 ....86.00
Munhall,Pa. U5 ....86.00
So.Chicago R2,U5,W14..86.00
So.Duquesne,Pa. U5 ...86.00
Struthers,O. Y1 ....86.00
Warren,O. C17 ....86.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 ....$96.50
Canton,O. R2 ....96.50
Cleveland R2 ....96.50
Gary,Ind. U5 ....96.50
So.Chicago R2, W14 ..96.50
So.Duquesne,Pa. U5 ...96.50

SKELP
Aliquippa,Pa. J5 ....4.00
Fontana,Calif. K1 ....4.775
LoneStar,Tex. L6 ....4.30
Munhall,Pa. U5 ....3.90
SparrowsPoint,Md. B2 ..3.90
Warren,O. R2 ....3.90
Youngstown R2, U5 ....3.90

WIRE RODS
AlabamaCity,Ala. R2 ..4.675
Aliquippa,Pa. J5 ....4.675
Alton,Ill. L1 ....4.85
Buffalo B11, W12 ....4.675
Cleveland A7 ....4.675
Donora,Pa. A7 ....4.675
Fairfield,Ala. T2 ....4.675
Fontana,Calif. K1 ....5.475
Houston S5 ....4.925
IndianaHarbor,Ind. Y1 .4.675
Johnstown,Pa. B2 ....4.675
Joliet,Ill. A7 ....4.675
KansasCity,Mo. S5 ....4.925
Kokomo,Ind. C16 ....4.775
LosAngeles B3 ....5.475
Minnequa,Colo. C10 ...4.925
Monessen,Pa. P7 ....4.675
No.Tonawanda,N.Y.B11 4.675
Pittsburg,Calif. C11 ...5.325
Portsmouth P12 ....4.675
Roebling,N.J. R5 ....4.775
So.Chicago,Ill. R2 ....4.675
SparrowsPoint,Md. B2..4.775
Sterling,Ill.(1) N15 ....4.675
Sterling,Ill. N15 ....4.775
Struthers,O. Y1 ....4.675
Torrance,Calif. C11 ....5.475
Worcester,Mass. A7 ...4.975

STRUCTURALS

Carbon Steel Stand. Shapes
Ala.City,Ala. R2 ....4.25
Aliquippa,Pa. J5 ....4.25
Bessemer,Ala. T2 ....4.25
Bethlehem,Pa. B2 ....4.30
Birmingham C15 ....4.25
Clairton,Pa. U5 ....4.25
Fairfield,Ala. T2 ....4.25
Fontana,Calif. K1 ....4.90
Gary,Ind. U5 ....4.25
Geneva,Utah C11 ....4.25
Houston S5 ....4.30
Ind.Harbor,Ind. I-2 ...4.25
Johnstown,Pa. B2 ....4.30
KansasCity,Mo. S5 ....4.30
Lackawanna,N.Y. B2 ..4.30
LosAngeles B3 ....4.95
Minnequa,Colo. C10 ...4.70
Munhall,Pa. U5 ....4.25
Niles,Calif. P1 ....4.90
Portland,Oreg. O4 ....5.00
Phoenixville,Pa. 4.20
Seattle B3 ....5.00
So.Chicago U5, W14 ...4.25
So.SanFrancisco B3 ...4.90
Torrance,Calif. C11 ....4.95
Weirton,W.Va. W6 ....4.25

Wide Flange
Bethlehem,Pa. B2 ....4.30
Clairton,Pa. U5 ....4.25
Fontana,Calif. K1 ....5.25
Lackawanna,N.Y. B2 ..4.30
Munhall,Pa. U5 ....4.25
Phoenixville,Pa. P4 ....4.30
So.Chicago,Ill. U5 ....4.25

Alloy Stand. Shapes
Clairton,Pa. U5 ....5.20
Fontana,Calif. K1 ....6.60
Gary,Ind. U5 ....5.20
Houston S5 ....5.25
Munhall,Pa. U5 ....5.20
So.Chicago,Ill. U5 ....5.20

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 ....6.40
Bessemer,Ala. T2 ....6.40
Bethlehem,Pa. B2 ....6.45
Clairton,Pa. U5 ....6.40
Fairfield,Ala. T2 ....6.40
Fontana,Calif. K1 ....7.05
Gary,Ind. U5 ....6.40
Geneva,Utah C11 ....6.40
Houston S5 ....6.45
Ind.Harbor,Ind. I-2, Y1..6.40
Johnstown,Pa. B2 ....6.45
KansasCity,Mo. S5 ....6.45
Lackawanna,N.Y. B2 ..6.45
LosAngeles B3 ....7.10
Munhall,Pa. U5 ....6.40
Seattle B3 ....7.15
So.Chicago,Ill. U5, W14..6.40
So.SanFrancisco B3 ...7.05
Struthers,O. Y1 ....6.40

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 ....6.45
Lackawanna,N.Y. B2 ..6.45
Munhall,Pa. U5 ....6.40
So.Chicago,Ill. U5 ....6.40

PILING

BEARING PILES
Munhall,Pa. U5 ....4.25
So.Chicago,Ill. U5 ....4.25

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ...5.075
Lackawanna,N.Y. B2 ..5.075
Munhall,Pa. U5 ....5.075
So.Chicago,Ill. U5 ....5.075

PLATES

PLATES, Carbon Steel
Ala.City,Ala. R2 ....4.225
Aliquippa,Pa. J5 ....4.225
Ashland,Ky.(15) A10 ..4.225
Bessemer,Ala. T2 ....4.225
Bridgeport,Conn. N19 ..4.475
Buffalo R2 ....4.225
Clairton, Pa. U5 ....4.225
Claymont,Del. C22 ....4.225
Cleveland J5, R2 ....4.225
Coatesville,Pa. L7 ....4.225
Conshohocken,Pa. A3 ..4.225
Ecorse,Mich. G5 ....4.325
Fairfield,Ala. T2 ....4.225
Fontana,Calif.(30) K1 ..4.875
Gary,Ind. U5 ....4.225
Geneva,Utah C11 ....4.225
GraniteCity,Ill. G4 ....4.425
Harrisburg,Pa. C5 ....4.225
Houston S5 ....4.275
Ind.Harbor,Ind. I-2, Y1..4.225
Johnstown,Pa. B2 ....4.225
Lackawanna,N.Y. B2 ..4.225
LoneStar,Tex. L6 ....4.55
Mansfield,O. E6 ....4.225
Minnequa,Colo. C10 ...5.075
Munhall,Pa. U5 ....4.225
Newport,Ky. N9 ....4.225
Pittsburgh J5 ....4.225
Riverdale,Ill. A1 ....4.225
Seattle B3 ....5.125
Sharon,Pa. S3 ....4.225
So.Chicago R2, U5, W14 4.225
SparrowsPoint,Md. B2..4.225
Steubenville,O. W10 ....4.225
Warren,O. R2 ....4.225
Weirton,W.Va. W6 ....4.225
Youngstown R2,U5,Y1..4.225

PLATES, Carbon Abras. Resist.
Fontana,Calif. K1 ....6.025
Geneva,Utah C11 ....5.375

PLATES, Wrought Iron
Economy,Pa. B14 ....9.80

PLATES, High-Strength Low-Alloy
Aliquippa,Pa. J5 ....6.45
Bessemer,Ala. T2 ....6.45
Clairton,Pa. U5 ....6.45
Cleveland J5, R2 ....6.45
Coatesville,Pa. L7 ....6.45
Conshohocken,Pa. A3 ..6.45
Ecorse,Mich. G5 ....6.55
Fairfield,Ala. T2 ....6.45
Fontana,Calif.(30) K1 ..7.15
Gary,Ind. U5 ....6.45
Geneva,Utah C11 ....6.45
Houston S5 ....6.50
Ind.Harbor,Ind. I-2, Y1..6.45
Johnstown,Pa. B2 ....6.45
Lackawanna,N.Y. B2 ..6.45
LosAngeles B3 ....7.35
Munhall,Pa. U5 ....6.45
Pittsburgh J5 ....6.45
Seattle B3 ....7.35
Sharon,Pa. S3 ....6.45
So.Chicago,Ill. U5, W14..6.45
SparrowsPoint,Md. B2 ..6.45
Youngstown U5, Y1 ....6.45

PLATES, Alloy
Claymont,Del. C22 ....5.80
Coatesville,Pa. L7 ....5.80
Fontana,Calif. K1 ....6.45
Gary,Ind. U5 ....5.80
Houston S5 ....5.85
Ind.Harbor,Ind. Y1 ....5.80
Johnstown,Pa. B2 ....5.80
Munhall,Pa. U5 ....5.80
Newport,Ky. N9 ....5.80
Seattle B3 ....6.70
Sharon,Pa. S3 ....5.80
So.Chicago,Ill. U5, W14..5.80
SparrowsPoint,Md. B2 ..5.80
Youngstown Y1 ....5.80

FLOOR PLATES
Cleveland J5 ....5.275
Conshohocken,Pa. A3 ..5.275
Harrisburg,Pa. C5 ....5.275
Ind.Harbor,Ind. I-2 ...5.275
Munhall,Pa. U5 ....5.275
So.Chicago,Ill. U5 ....5.275

PLATES, Ingot Iron
Ashland c.l. (15) A10..4.475
Ashland l.c.l. (15) A10..4.975
Cleveland c.l. R2 ....4.825
Warren,O. c.l. R2 ....4.825

BARS

BAR, Hot-Rolled Carbon
Ala.City,Ala. R2 ....4.30
Aliquippa,Pa. J5 ....4.30
Alton,Ill. L1 ....4.50
Atlanta A11 ....4.50
Bessemer,Ala. T2 ....4.30
Birmingham C15 ....4.30
Bridgeport,Conn. N19 ...4.55
Buffalo R2 ....4.30
Canton,O. R2 ....4.40
Clairton,Pa. U5 ....4.30
Cleveland R2 ....4.30
Ecorse,Mich. G5 ....4.40
Emeryville,Calif. J7 ....5.05
Fairfield,Ala. T2 ....4.30
FairlessHills,Pa. U5 ....4.45
Fontana,Calif. K1 ....5.00
Gary,Ind. U5 ....4.30
Houston S5 ....4.55
Ind.Harbor,Ind. I-2, Y1..4.30
Johnstown,Pa. B2 ....4.30
Joliet,Ill. P22 ....4.30
KansasCity,Mo. S5 ....4.55
Lackawanna,N.Y. B2 ..4.30
LosAngeles B3 ....5.00
Massillon,O. R2 ....4.40
Midland,Pa. C18 ....4.30
Milton,Pa. M18 ....4.30
Minnequa,Colo. C10 ...4.75
Niles,Calif. P1 ....5.00
N.Tonawanda,N.Y. B11..4.30
Pittsburg,Calif. C11 ...5.00
Pittsburgh J5 ....4.30
Portland,Oreg. O4 ....5.05
Seattle B3, N14, P23 ...5.05
So.Chicago R2,U5,W14 ..4.30
So.Duquesne,Pa. U5 ....4.30
So.SanFran.,Calif. B3 ..5.05
Sterling,Ill.(1) N15 ....4.30
Sterling,Ill. N15 ....4.40
Struthers,O. Y1 ....4.30
Torrance,Calif. C11 ....5.00
Warren,O. R2 ....4.30
Weirton,W.Va. W6 ....4.30
Youngstown R2, U5 ....4.30

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ....5.075
Bridgeport,Conn. N19 ..5.225
Buffalo R2 ....5.075
Canton,O. R2, T7 ....5.075
Clairton,Pa. U5 ....5.075
Detroit R7 ....5.075
Ecorse,Mich. G5 ....5.175
Fontana,Calif. K1 ....6.125
FairlessHills,Pa. U5 ....5.225
Gary,Ind. U5 ....5.075
Houston S5 ....5.325
Ind.Harbor,Ind. I-2, Y1..5.075
Johnstown,Pa. B2 ....5.075
KansasCity,Mo. S5 ....5.325
Lackawanna,N.Y. B2 ..5.075
LosAngeles B3 ....6.125
Massillon,O. R2 ....5.075
Midland,Pa. C18 ....5.075
So.Chicago R2,U5,W14..5.075
So.Duquesne,Pa. U5 ....5.075
Struthers,O. Y1 ....5.075
Warren,O. C17 ....5.075
Youngstown U5 ....5.075

BARS, H.R. Leaded Alloy
Warren,O. C17 ....5.825

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy
Aliquippa,Pa. J5 ....6.45
Bessemer,Ala. T2 ....6.45
Bethlehem,Pa. B2 ....6.45
Clairton,Pa. U5 ....6.45
Cleveland R2 ....6.45
Ecorse,Mich. G5 ....6.55
Fairfield,Ala. T2 ....6.45
Fontana,Calif. K1 ....7.70
Gary,Ind. U5 ....6.45
Houston S5 ....6.70
Ind.Harb.,Ind. I-2, Y1 ..6.45
Johnstown,Pa. B2 ....6.45
KansasCity,Mo. S5 ....6.70
Lackawanna,N.Y. B2 ..6.45
LosAngeles B3 ....7.15
Pittsburgh J5 ....6.45
Seattle B3 ....7.20
So.Chicago W14 ....6.45
So.Duquesne,Pa. U5 ....6.45
So.SanFrancisco B3 ...7.20
Struthers,O. Y1 ....6.45
Warren,O. R2 ....6.45
Youngstown U5 ....6.45

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa. B2 ....4.45

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 ....4.30
Atlanta A11 ....4.50
Fontana,Calif. K1 ....5.00
Niles,Calif. P1 ....5.00
Pittsburgh J5 ....4.30
Portland,Oreg. O4 ....5.05
SanFrancisco S7 ....4.70

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 ....5.20
Gary,Ind. U5 ....5.20
Houston S5 ....5.45
KansasCity,Mo. S5 ....5.45
Youngstown U5 ....5.20

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....5.40
BeaverFalls,Pa. M12, R2..5.40
Buffalo B5 ....5.45
Camden,N.J. P13 ....5.85
Carnegie,Pa. C12 ....5.40
Chicago W18 ....5.40
Cleveland A7, C20 ....5.40
Detroit R7 ....5.40
Detroit B5, P17 ....5.80
Donora,Pa. A7 ....5.49
Elyria,O. W8 ....5.40
FranklinPark,Ill. N5 ....5.40
Gary,Ind. R2 ....5.40
GreenBay, Wis. F7 ....5.40
Hammond,Ind. L2, M13..5.40
Hartford,Conn. R2 ....5.90
Harvey,Ill. B5 ....5.40
LosAngeles R2, S30 ....6.85
Mansfield,Mass. B5 ....5.95
Massillon,O. R2, R8 ....5.40
Midland,Pa. C18 ....5.40
Monaca,Pa. S17 ....5.40
Newark,N.J. W18 ....5.85
NewCastle,Pa.(17) B4 ..5.40
Pittsburgh J5 ....5.40
Plymouth,Mich. P5 ....5.65
Putnam,Conn. W18 ....5.95
Readville,Mass. C14 ....5.95
So.Chicago,Ill. W14 ....5.40
SpringCity,Pa. K3 ....5.95
Struthers,O. Y1 ....5.40
Waukegan,Ill. A7 ....5.40
Worcester,Mass. W19 ...5.85
Youngstown F3, Y1 ....5.40

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19..4.65

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....6.625
BeaverFalls,Pa. M12,R2 6.625
Bethlehem,Pa. B2 ....6.625
Buffalo B5 ....6.625
Camden,N.J. P13 ....6.80
Canton,O. T7 ....6.625
Carnegie,Pa. C12 ....6.625
Chicago W18 ....6.625
Cleveland A7, C20 ....6.625
Detroit R7 ....6.625
Detroit B5, P17 ....6.825
Donora,Pa. A7 ....6.625
Elyria,O. W8 ....6.625
Gary,Ind. R2 ....6.625
GreenBay,Wis. F7 ....6.625
Hammond,Ind. L2,M13..6.625
Hartford,Conn. R2 ....6.925
Harvey,Ill. B5 ....6.625
Lackawanna,N.Y. B2 ..6.625
LosAngeles S30 ....6.30
Mansfield,Mass. B5 ...6.925
Massillon,O. R2, R8 ..6.625
Midland,Pa. C18 ....6.625
Monaca,Pa. S17 ....6.625
Newark,N.J. W18 ....6.80
Plymouth,Mich. P5 ....6.825
So.Chicago W14 ....6.625
SpringCity,Pa. K3 ....6.80
Struthers,O. Y1 ....6.625
Warren,O. C17 ....6.625
Waukegan,Ill. A7 ....6.625
Worcester,Mass. A7 ...6.925
Youngstown F3, Y1....6.625

BARS, C.F. Leaded Alloy
Ambridge,Pa. W18 ....7.525
Camden,N.J. P13 ....7.70
Carnegie,Pa. C12 ....7.525
Chicago W18 ....7.525
Cleveland C20 ....7.525
Monaca,Pa. S17 ....7.525
Newark,N.J. W18 ....7.70
SpringCity,Pa. K3 ....7.70
Warren,O. C17 ....7.525

BARS, Reinforcing (To Fabricators)
Ala.City,Ala. R2 ....4.30
Atlanta A11 ....4.50
Birmingham C15 ....4.30
Buffalo R2 ....4.30
Cleveland R2 ....4.30
Emeryville,Calif. J7 ....5.05
Fairfield,Ala. T2 ....4.30
FairlessHills,Pa. U5 ....4.45
Fontana,Calif. K1 ....5.00
Ft.Worth,Tex.(42) T4 ..4.90
Gary,Ind. U5 ....4.30
Houston S5 ....4.55

Ind.Harbor,Ind. I-2, Y1..4.30
Johnstown,Pa. B2 .....4.30
Joliet,Ill. P22 .....4.30
KansasCity,Mo. S5 ....4.55
Lackawanna,N.Y. B2 ...4.30
LosAngeles B3 .....5.00
Milton,Pa. M18 .....4.30
Minnequa,Colo. C10 ....4.75
Niles,Calif. P1 .....5.00
Pittsburg,Calif. C11 ...5.00
Pittsburgh J5 .....4.30
Portland,Oreg. O4 .....5.05
SandSprings,Okla. S5 ...4.80
Seattle B3, N14, P23 ...5.05
So.Chicago R2 .....4.30
So.Duquesne,Pa. U5 ....4.30
So.SanFrancisco B3 ....5.05
SparrowsPoint,Md. B2 ..4.30
Sterling,Ill.(1) N15 ....4.30
Sterling,Ill. N15 .....4.40
Struthers,O. Y1 .....4.30
Torrance,Calif. C11 ....5.00
Youngstown R2, U5 ....4.30

BARS, Reinforcing
(Fabricated; to Consumers)

Johnstown,Pa. ¼-1" B2..5.70
KansasCity,Kans. S5 ...6.50
LosAngeles B3 .....5.95
Marion,O. P11 .....5.55
Pittsburgh J5, U8 .....5.72
Seattle B3, N14, P23 ...6.15
So.SanFrancisco B3 ....6.00
SparrowsPt. ¼-1" B2 ..5.70
Williamsport,Pa. S19 ..5.60

RAIL STEEL BARS

Avis,Pa.(3) J8 .....4.25
ChicagoHts.(3) C2, I-2..4.20
ChicagoHts.(4) C2, I-2..4.30
Ft.Worth,Tex.(26) T4 ..4.75
Franklin,Pa.(3) F5 ....4.20
Franklin,Pa.(4) F5 ....4.30
Marion,O.(3) P11 .....4.20
Moline,Ill(3) R2 .....4.30
Tonawanda(3) B12 ....4.15
Tonawanda(4) B12 ....4.30
Williamsport,Pa.(3) S19.4.30

BARS, Wrought Iron

Economy,Pa.(S.R.) B14 10.85
Economy,Pa.(D.R.) B14 13.50
Economy(Staybolt) B14 13.80
McK.Rks(S.R.) L5 ....10.85
McK.Rks.(D.R.) L5 ...14.75
McK.Rks.(Staybolt) L5 16.25

SHEETS

SHEETS, Hot-Rolled Steel
(18 Gage and Heavier)

Ala.City,Ala. R2 .....4.05
Allenport,Pa. P7 .....4.05
Ashland,Ky.(8) A10 ....4.05
Cleveland J5, R2 .....4.05
Conshohocken,Pa. A3 ...4.10
Detroit(8) M1 .....4.15
Dravosburg,Pa. U5 .....4.05
Ecorse,Mich. G5 .....4.15
Fairfield,Ala. T2 .....4.05
FairlessHills,Pa. U5 ....4.10
Fontana,Calif. K1 ....4.825
Gary,Ind. U5 .....4.05
Geneva,Utah C11 .....4.15
GraniteCity,Ill. G4 ....4.25
Ind.Harbor,Ind. I-2, Y1..4.05
Kokomo,Ind. C16 .....4.15
Lackawanna,N.Y. B2 ...4.05
Mansfield,O. E6 (37) ...4.05
Mansfield,O. E6 (38) ...4.80
Munhall,Pa. U5 .....4.05
Newport,Ky. N9 .....4.05
Niles,O. N12 .....4.05
Pittsburg,Calif. C11 ....4.75
Pittsburgh J5 .....4.05
Portsmouth,O. P12 ....4.05
Riverdale,Ill. A1 .....4.05
Sharon,Pa. S3 .....4.05
So.Chicago,Ill. W14 ....4.05
SparrowsPoint,Md. B2 ..4.05
Steubenville,O. W10 ....4.05
Warren,O. R2 .....4.05
Weirton,W.Va. W6 ....4.05
Youngstown U5, Y1 ....4.05

SHEETS, H.R. (19 Ga. & Lighter)

Ala.City,Ala. R2 .....5.35
Kokomo,Ind. C16.....5.20
Niles,O. N12 .....4.95

SHEETS, H.R. Alloy

Ind.Harbor,Ind. Y1 ....5.80
Youngstown Y1 .....5.80

SHEETS, H.R. (14 Ga. & Heavier)
High-Strength Low-Alloy

Cleveland J5, R2 .....6.10
Conshohocken,Pa. A3 ...6.15
Dravosburg,Pa. U5 ....6.10
Ecorse,Mich. G5 .....6.20
Fairfield,Ala T2 .....6.10
FairlessHills,Pa. U5 ....6.15
Fontana,Calif. K1 ....6.875
Gary,Ind. U5 .....6.10
Ind.Harbor,Ind. I-2, Y1..6.10
Lackawanna(35) B2 ....6.10
Munhall,Pa. U5 .....6.10
Pittsburgh J5 .....6.10
Sharon,Pa. S3 .....6.10
So.Chicago,Ill. U5 .....6.10
SparrowsPoint(36) B2 ..6.10
Warren,O. R2 .....6.10
Weirton,W.Va. W6 ....6.10
Youngstown U5, Y1 ....6.10

SHEETS, Hot-Rolled Ingot Iron
(18 Gage and Heavier)

Ashland,Ky.(8) A10 ....4.30
Cleveland R2 .....4.65
Ind.Harbor,Ind. I-2 ....4.30
Warren,O. R2 .....4.65

SHEETS, Cold-Rolled Steel
(Commercial Quality)

Allenport,Pa. P7 .....4.95
Cleveland J5, R2 .....4.95
Conshohocken,Pa. A3 ...5.00
Dravosburg,Pa. U5 ....4.95
Ecorse,Mich. G5 .....5.05
Fairfield,Ala. T2 .....4.95
FairlessHills,Pa. U5 ....5.00
Follansbee,W.Va. F4 ...4.95
Fontana,Calif. K1 .....6.05
Gary,Ind. U5 .....4.95
GraniteCity,Ill. G4 .....5.15
Ind.Harbor,Ind. I-2, Y1.4.95
Lackawanna,N.Y. B2 ...4.95
Middletown,O. A10 ....4.95
Newport,Ky. N9 .....4.95
Pittsburg,Calif. C11 ....5.90
Pittsburgh J5 .....4.95
Portsmouth,O. P12 ....4.95
SparrowsPoint,Md. B2..4.95
Warren,O. R2 .....4.95
Weirton,W.Va. W6 ....4.95
Youngstown Y1 .....4.95

SHEETS, Cold-Rolled
High-Strength Low-Alloy

Cleveland J5, R2 .....7.50
Dravosburg,Pa. U5 ....7.50
Ecorse,Mich. G5 .....7.60
FairlessHills,Pa. U5 ....7.55
Fontana,Calif. K1 .....8.55
Gary,Ind. U5 .....7.50
IndianaHarbor,Ind. Y1 ..7.50
Lackawanna(37) B2 ....7.50
Pittsburgh J5 .....7.50
SparrowsPoint(38) B2 ..7.50
Warren,O. R2 .....7.50
Weirton,W.Va. W6 ....7.50
Youngstown Y1 .....7.50

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....5.55
Middletown,O. A10 ....5.45
Warren,O. R2 .....5.55

SHEETS, Culvert (16 Gage)	Cu Alloy	Cu Fe
Ashland,Ky. A10	6.50	....
Canton,O. R2	6.50	7.10
Dravosburg U5	5.70	....
Fairfield T2	5.70	....
Gary,Ind. U5	5.70	5.95
Ind.Harbor I-2	5.70	5.95
Kokomo,Ind. C16	5.80	....
MartinsFry. W10	5.70	....
Newport,Ky N9	5.70	5.95
Pitts.,Calif. C11	6.45	....
SparrowsPt. B2	5.70	....

SHEETS, Culvert—Pure Iron

Ashland,Ky. A10 .....6.75
Gary,Ind. U5 .....5.95
MartinsFerry,O. W10 ...5.95

SHEETS, Galvanized Steel
Hot-Dipped

Ala.City,Ala. R2 .....5.45‡
Ashland,Ky. A10 .....5.45*
Butler,Pa. A10 .....5.45†
Canton,O. R2 .....5.45‡
Delphos,O. N16 .....6.10‡
Dover,O. R1 .....5.45‡
Dravosburg,Pa. U5 ....5.45†
Fairfield,Ala. T2 .....5.45†
Gary,Ind. U5 .....5.45*
GraniteCity,Ill. G4 ....5.65‡
Ind.Harbor,Ind. I-2 ....5.45†
Kokomo,Ind. C16 .....5.55‡
MartinsFerry,O. W10 ..5.45*
Middletown,O. A10 ....5.45†
Newport,Ky. N9 .....5.45‡
Niles,O. N12 .....5.45‡
Pittsburg,Calif. C11 ..6.20*
SparrowsPt.,Md. B2 ...5.45‡
Warren,O. R2 .....5.45†
Weirton,W.Va. W6 ....5.45*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Wall Casing

Fontana,Calif. K1 ....6.325

SHEETS, Galvanized
High-Strength Low-Alloy

Dravosburg,Pa. U5 ....8.30
SparrowsPoint(30) B2 ..8.30

SHEETS, Galvanneal Steel

Canton,O. R2 .....5.85
Dravosburg,Pa. U5 ....5.85
Kokomo,Ind. C16 .....6.20
Newport,Ky. N9 .....5.85
Niles,O. N12 .....5.85

SHEETS, Galvanized Ingot Iron

Ashland,Ky.(8) A10 ....5.70
Canton,O. R2 .....6.20

SHEETS, Galvanized
Ingot Iron
(Hot-dipped Continuous)

Ashland,Ky. A10 .....5.70
Butler,Pa. A10 .....5.70
Middletown,O. A10 ....5.70

SHEETS, Electrogalvanized

Cleveland(28) R2 .....6.30
Niles,O.(28) R2 .....6.30
Weirton,W.Va. W6 ....6.15

SHEETS, Aluminum Coated

Butler,Pa. A10 .....8.625

SHEETS, Enameling Iron

Ashland,Ky.(8) A10 ...5.375
Cleveland R2 .....5.375
Dravosburg,Pa. U5 ...5.375
Gary,Ind. U5 .....5.375
GraniteCity,Ill. G4 ....5.575
Ind.Harbor,Ind. I-2 ...5.375
Middletown,O. A10 ....5.375
Niles,O. N12 .....5.375
Youngstown Y1 .....5.375

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ..7.375
Follansbee(23) F4 .....6.60
Yorkville,O. W10 .....7.375

SHEETS, Long Terne Steel
(Commercial Quality)

BeechBottom,W.Va. W10 5.85
Gary,Ind. U5 .....5.85
Mansfield,O. E6 .....5.85
Middletown,O. A10 ....5.85
Niles,O. N12 .....5.85
Weirton,W.Va. W6 ....5.85

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....6.25

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A6 American Shim Steel Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div. Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C31 Chester Blast Furnace Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas & Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Div., Jones & Laughlin Steel Corp.
M14 McInnes Steel Co.
M16 Md. Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman & Scott

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng.High Carb.Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Northwest.SteelRoll.Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
N19 Northeastern Steel Corp.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P23 Pacific Steel Rolling

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RellanceDiv.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Products
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel&Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	4.05
Allenport,Pa. P7	4.05
Alton,Ill. L1	4.225
Ashland,Ky.(8) A10	4.05
Atlanta A11	4.25
Bessemer,Ala. T2	4.05
Birmingham C15	4.05
Bridgeport,Conn. N19	4.35
Buffalo(27) R2	4.05
Conshohocken,Pa. A3	4.10
Detroit M1	4.15
Ecorse,Mich. G5	4.15
Fairfield,Ala. T2	4.05
Fontana,Calif. K1	4.825
Gary,Ind. U5	4.05
Ind.Harbor,Ind. I-2, Y1	4.05
Johnstown,Pa.(25) B2	4.05
Lackaw'na,N.Y.(25) B2	4.05
LosAngeles(25) B3	4.80
Milton,Pa. M18	4.05
Minnequa,Colo. C10	5.15
N.Tonawanda,N.Y. B11	4.05
Pittsburg,Calif. C11	4.80
Portsmouth,O. P12	4.05
Riverdale,Ill. A1	4.05
SanFrancisco S7	5.00
Seattle(25) B3, P23	5.05
Seattle N14	5.05
Sharon,Pa. S3	4.05
So.Chicago,Ill. W14	4.05
So.SanFrancisco(25) B3	4.80
SparrowsPoint,Md. B2	4.05
Sterling(1) N15	4.05
Sterling,Ill. N15	4.15
Torrance,Calif. C11	4.80
Warren,O. R2	4.05
Weirton,W.Va. W6	4.05
Youngstown U5	4.05

STRIP, Hot-Rolled Alloy

Bridgeport,Conn. N19	7.00
Carnegie,Pa. S18	6.70
Fontana,Calif. K1	8.10
Gary,Ind. U5	6.70
Ind.Harbor,Ind. Y1	6.70
LosAngeles B3	7.90
Newport Ky. N9	6.70
Seattle P23	7.80
Sharon,Pa. S3	6.70
So.Chicago W14	6.70
Youngstown U5, Y1	6.70

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	6.15
Conshohocken,Pa. A3	6.15
Ecorse,Mich. G5	6.25
Fairfield,Ala. T2	6.15
Fontana,Calif. K1	7.25
Gary,Ind. U5	6.15
Houston S5	6.40
Ind.Harbor,Ind. I-2, Y1	6.15
KansasCity,Mo. S5	6.40
Lackawanna,N.Y. B2	6.15
LosAngeles(25) B3	6.90
Seattle(25) B3, P23	7.15
Sharon,Pa. S3	6.15
So.SanFrancisco(25) B3	6.90
SparrowsPoint,Md. B2	6.15
Warren,O. R2	6.15
Weirton,W.Va. W6	6.15
Youngstown U5, Y1	6.15

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	4.30
Warren,O. R2	4.65

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	5.75
Baltimore T6	5.75
Boston T6	6.30
Cleveland A7, J5	5.75
Conshohocken,Pa. A3	5.80
Dearborn,Mich. D3	5.85
Detroit D2, M1, P20	5.85
Dover,O. G6	5.75
Ecorse,Mich. G5	5.85
Follansbee,W.Va. F4	5.75
Fontana,Calif. K1	7.50
FranklinPark,Ill. T6	5.85
Ind.Harbor,Ind. I-2	5.85
Ind.Harbor,Ind. Y1	5.75
Indianapolis C8	5.90
LosAngeles C1	7.80
Middletown,O. A10	5.75
NewBedford,Mass. R10	6.20
NewBritain(10) S15	5.75
NewCastle,Pa. B4, E5	5.75
NewHaven,Conn. A7	6.50
NewHaven,Conn. D2	6.20
NewKensington,Pa. A6	5.75
Pawtucket,R.I. R3	6.40
Pawtucket,R.I. N8	6.30
Pittsburgh J5	5.75
Portsmouth,O. P12	5.75
Riverdale,Ill. A1	5.85
Rome,N.Y.(32) R6	5.75
Sharon,Pa. S3	5.75
SparrowsPt.,Md. B2	5.75
Trenton,N.J.(31) R5	7.30
Wallingford,Conn. W2	6.20
Warren,O. B9, R2, T5	5.75
Weirton,W.Va. W6	5.75
Worcester,Mass. A7	6.60
Youngstown C8, Y1	5.75

STRIP, Cold-Rolled Alloy

Boston T6	12.80
Carnegie,Pa. S18	12.45
Cleveland A7	12.45
Dover,O. G6	12.45
Fontana,Calif. K1	14.55
FranklinPark,Ill. T6	12.45
Harrison,N.J. C18	12.45
Pawtucket,R.I. N8	12.80
Sharon,Pa. S3	12.45
Worcester,Mass. A7	12.75
Youngstown C8	12.90

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland A7, J5	8.60
Dearborn,Mich. D3	8.70
Dover,O. G6	8.60
Ecorse,Mich. G5	8.70
Ind.Harbor,Ind. Y1	8.60
Lackawanna,N.Y. B2	8.425
Pittsburgh J5	8.60

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	5.75	8.35	9.30	11.45	14.15
Boston T6	6.30	8.35	9.30	11.45	14.15
Bristol,Conn. W1	...	...	9.30	11.45	....
Carnegie,Pa. S18	...	8.05	9.00	11.15	13.85
Cleveland A7	5.75	8.05	9.00	11.15	13.85
Cleveland C7	...	8.05	9.00	11.15	13.85
Dearborn,Mich. D3	5.85	8.25	9.20	....	....
Detroit D2	5.85	8.25	9.20	10.95	....
Dover,O. G6	5.85	8.05	9.00	11.15	13.85
FranklinPark,Ill. T6	5.85	8.05	9.00	11.15	13.85
Harrison,N.J. C18	...	...	9.30	11.45	14.15
Indianapolis C8	6.00	8.20	9.00	11.15	13.85
NewBritain,Conn.(10) S15	5.75	8.05	9.00	11.15	13.85
NewCastle,Pa. B4	5.75	8.05	9.00	11.15	....
NewCastle,Pa. E5	5.75	8.05	9.00	11.15	13.85
NewHaven,Conn. D2	6.20	8.35	9.30	11.25	....
NewKensington,Pa. A6	5.75	8.05	9.00	11.15	....
NewYork W3	...	8.35	9.30	11.45	14.15
Pawtucket,R.I. N8	6.30	8.35	9.30	11.45	14.15
Riverdale,Ill. A1	5.85	8.05	9.00	11.15	13.85
Rome,N.Y.(32) R6	5.75	8.05	9.00	10.95	13.25
Sharon,Pa. S3	5.75	8.05	9.00	11.15	13.85
Trenton,N.J. R5	...	8.35	9.30	11.45	14.15
Wallingford,Conn. W2	6.20	8.35	9.30	11.45	14.15
Warren,O. T5	5.75	8.05	9.00	11.15	13.85
Weirton,W.Va. W6	5.75	8.05	9.00	11.15	13.85
Worcester,Mass. A7, T6	6.60	8.35	9.30	11.45	14.15
Youngstown C8	5.85	8.05	9.00	11.15	13.85
Spring Steel (Tempered)					
Bristol,Conn. W1	...	...	12.90	15.60	....
Buffalo W12	...	...	12.90	....	....
FranklinPark,Ill. T6	...	...	13.40	16.10	19.50
Harrison,N.J. C18	...	...	12.90	15.60	19.00
New York W3	...	...	12.90	15.60	19.00
Trenton,N.J. R5	...	...	12.90	15.60	19.00
Worcester,Mass. A7, T6	...	...	12.90	15.60	19.00
Worcester,Mass. W12	...	...	12.90	....	....
Youngstown C8	...	...	13.25	15.95	19.35

SILICON STEEL

H.R. SHEETS (22 Ga., cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	....	9.10	10.10	11.00
Brackenridge,Pa. A4	....	....	9.10	10.10	11.00
Mansfield,O. E6	8.025	8.50	9.10	10.10	11.00
Newport,Ky. N9	8.025	8.50	9.10	10.10	11.00
Niles,O. N12	8.025	8.50	9.10	10.10	....
Vandergrift,Pa. U5	....	8.50	9.10	10.10	11.00
Warren,O. R2	8.025	8.50	9.10	10.10	11.00
Zanesville,O. A10	....	8.50	9.10	10.10	11.00

C.R. COILS & CUT LENGTHS, (22 Ga.) Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
Brackenridge,Pa. A4	....	....	9.85	10.85	11.75
GraniteCity,Ill. G4	8.425*	8.95*	9.55*	10.55*	....
IndianaHarbor,Ind. I-2	8.225	8.75*	9.35*	....	....
Vandergrift,Pa. U5	....	9.25†	9.85†	10.85†	11.75†
Vandergrift,Pa. U5	8.225*	8.75*	9.35*	10.35*	11.25*
Warren,O. R2	8.225†	9.25	9.85	10.85	11.75
Zanesville,O. A10	....	9.25	9.85	10.85	11.75

H.R. SHEETS (22 Ga., cut lengths)	Transformer Grade T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	11.95	12.50	13.00	14.00
Brackenridge,Pa. A4	11.95	....	....	....
Newport,Ky. N9	11.95	....	....	....
Vandergrift,Pa. U5	11.95	12.50	13.00	14.00
Zanesville,O. A10	11.95‡	12.50‡	13.00‡	14.00‡

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-72
Brackenridge,Pa. A4	....	15.00	16.60	17.10	....
Butler,Pa. A10	....	....	16.60	17.10	....
Vandergrift,Pa. U5	14.00	15.00	16.60	17.10	12.70
Warren,O. R2	....	....	....	....	12.70‡

*Semiprocessed. †Fully processed only. ‡Coils annealed; semiprocessed ½c lower. §Coils, ¾-cent higher.

STRIP	
Sharon,Pa. S3	5.75
SparrowsPt.,Md. B2	5.75
Trenton,N.J.(31) R5	7.30
Wallingford,Conn. W2	6.20
Warren,O. B9, R2, T5	5.75
Weirton,W.Va. W6	5.75
Worcester,Mass. A7	6.60
Youngstown C8, Y1	5.75
STRIP, Cold-Rolled Ingot Iron	
Warren,O. R2	6.35
STRIP, Electrogalvanized	
Cleveland A7	5.75*
Dover,O. G6	5.75*
Riverdale,Ill. A1	5.85*
Youngstown C8	5.75*
Warren,O. B9, T5	5.75*
Weirton,W.Va. W6	5.75*
Worcester,Mass. A7	6.60*

*Plus galvanizing extras.

Strip, Galvanized (Continuous)	
Sharon,Pa. S3	6.15
Warren,O. B9	6.15
TIGHT COOPERAGE HOOP	
Atlanta A11	4.775
Riverdale,Ill. A1	4.625
Sharon,Pa. S3	4.475
Youngstown U5	4.475

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.50	$7.75	$8.15
Dravosburg,Pa. U5	7.50	7.75	8.15
Fairfield,Ala. T2	7.60	7.85	8.25
FairiessHills,Pa. U5	7.60	7.85	8.25
Gary,Ind. U5	7.50	7.75	8.15
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.50	7.75	8.15
Niles,O. R2	7.50	7.75	8.15
Pittsburg,Calif. C11	8.25	8.50	8.90
SparrowsPoint,Md. B2	7.60	7.85	8.25
Weirton,W.Va. W6	7.50	7.75	8.15
Yorkville,O. W10	7.50	7.75	8.15

ELECTROTIN (22-27 Gage; Dollars per 100 lb)			
Aliquippa,Pa. J5	6.175	....	....
Niles,O. R2	6.175	6.375	6.575

TINPLATE, American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.80	$9.05
Dravosburg,Pa. U5	8.80	9.05
Fairfield,Ala. T2	8.90	9.15
Fairiess,Pa. U5	8.90	9.15
Gary,Ind. U5	8.80	9.05
Ind.Har. I-2, Y1	8.80	9.05
Pitts.Calif. C11	9.55	9.80
Sp.Pt.,Md. B2	8.90	9.15
Warren,O. R2	8.80	9.05
Weirton,W.Va. W6	8.80	9.05
Yorkville,O. W10	8.80	9.05

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$6.60
Dravosburg,Pa. U5	6.60
Fairfield,Ala. T2	6.70
FairiessHills,Pa. U5	6.70
Gary,Ind. U5	6.60
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2, Y1	6.60
Niles,O. R2	6.60
Pittsburg,Calif. C11	7.35
SparrowsPoint,Md. B2	6.70
Warren,O. R2	6.60
Weirton,W.Va. W6	6.60
Yorkville,O. W10	6.60

HOLLOWARE ENAMELING Black Plate (29 Gage)

Dravosburg,Pa. U5	6.20
Follansbee,W.Va. F4	6.20
Gary,Ind. U5	6.20
GraniteCity,Ill. G4	6.30
Ind.Harbor,Ind. Y1	6.20
Yorkville,O. W10	6.20

MANUFACTURING TERNES (Special Coated; Base Box)

Dravosburg,Pa. U5	$7.85
Gary,Ind. U5	7.85
Yorkville,O. W10	7.85

MANUFACTURING TERNES (Light Coated, 6 lb; Base Box)

Yorkville,O. W10	$8.75

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.85

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	5.75
Aliquippa,Pa. J5	5.75
Alton,Ill. L1	5.925
Atlanta A11	5.95
Bartonville,Ill. K4	5.85
Buffalo W12	5.75
Chicago W13	5.75
Cleveland A7, C20	5.75
Crawfordsville,Ind. M8	5.85
Donora,Pa. A7	5.75
Duluth,Minn. A7	5.75
Fairfield,Ala. T2	5.75
Fostoria,O.(24) S1	5.95
Houston S5	6.00
Jacksonville,Fla. M8	6.27
Johnstown,Pa. B2	5.75
Joliet,Ill. A7	5.75
KansasCity,Mo. S5	6.00
Kokomo,Ind. C16	5.85
LosAngeles B3	6.70
Minnequa,Colo. C10	6.00
Monessen,Pa. P7	5.75
Newark 6-8 ga. I-1	6.40
No. Tonawanda B11	5.75
Palmer,Mass. W12	6.05
Pittsburg,Calif. C11	6.70
Portsmouth,O. P12	5.75
Rankin,Pa. A7	5.75
So.Chicago,Ill. R2	5.75
So.SanFrancisco C10	6.70
SparrowsPoint,Md. B2	5.85
Sterling,Ill.(1) N15	5.75
Sterling,Ill. N15	5.85
Struthers,O. Y1	5.75
Waukegan,Ill. A7	5.75
Worcester,Mass. A7	6.05

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	7.20
Alton,Ill. L1	7.375
Bartonville,Ill. K4	7.30
Buffalo W12	7.20
Cleveland A7	7.20
Donora,Pa. A7	7.20
Duluth,Minn. A7	7.20
Fostoria,O. S1	7.20
Johnstown,Pa. B2	7.20
LosAngeles B3	8.15
Milbury,Mass.(12) N6	7.50
Minnequa,Colo. C10	7.45
Monessen,Pa. P7, P16	7.20
Muncie,Ind. I-7	7.40
Palmer,Mass. W12	7.50
Pittsburg,Calif. C11	8.15
Portsmouth,O. P12	7.20
Roebling,N.J. R5	7.50
So.Chicago,Ill. R2	7.20
So.SanFrancisco C10	8.15
SparrowsPt.,Md. B2	7.30
Struthers,O. Y1	7.20
Trenton,N.J. A7	7.50
Waukegan,Ill. A7	7.20
Worcester A7,J4,T6,W12	7.50

WIRE, Upholstery Spring

Aliquippa,Pa. J5	6.90
Alton,Ill. L1	7.075
Buffalo W12	6.90
Cleveland A7	6.90
Donora,Pa. A7	6.90
Duluth,Minn. A7	6.90
Johnstown,Pa. B2	6.90
KansasCity,Mo. S5	7.50
LosAngeles B3	7.85
Minnequa,Colo. C10	7.075
Monessen,Pa. P7, P16	6.90
NewHaven,Conn. A7	7.20
Palmer,Mass. W12	7.20
Pittsburg,Calif. C11	7.85
Portsmouth,O. P12	6.90
Roebling,N.J. R5	7.20
So.Chicago,Ill. R2	6.90
So.SanFrancisco C10	7.85
SparrowsPoint,Md. B2	7.00
Struthers,O. Y1	6.90
Trenton,N.J. A7	7.20
Waukegan,Ill. A7	6.90
Worcester,Mass. A7	7.20

WIRE, Fine & Weaving (8" Coils)

Alton,Ill. L1	11.375
Bartonville,Ill. K4	11.30
Buffalo W12	11.20
Chicago W13	11.20
Cleveland A7	11.20
Crawfordsville,Ind. M8	11.30
Fostoria,O. S1	11.20
Jacksonville,Fla. M8	11.73
Johnstown,Pa. B2	11.20
Kokomo,Ind. C16	11.20
Minnequa,Colo. C10	10.95
Monessen,Pa. P16	11.20
Muncie,Ind. I-7	11.40
Palmer,Mass. W12	11.50
Roebling,N.J. R5	11.50
So.SanFrancisco C10	11.55
Waukegan,Ill. A7	11.20
Worcester,Mass. A7, T6	11.50

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	9.90
Buffalo W12	9.90
Johnstown,Pa. B2	9.90
Minnequa,Colo. C10	10.025
Monessen,Pa. P16	9.90
Muncie,Ind. I-7	10.10
Portsmouth,O. P12	9.90
Roebling,N.J. R5	10.20
SparrowsPt.,Md. B2	10.00

ROPE WIRE	(A)
Alton,Ill. L1	9.75
Bartonville,Ill. K4	9.75
Buffalo W12	9.75
Fostoria,O. S1	9.75
Johnstown,Pa. B2	9.75
Monessen,Pa. P7, P16	9.75
Muncie,Ind. I-7	9.95
Palmer,Mass. W12	10.05
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
SparrowsPt. B2	9.85
Struthers,O. Y1	9.75
Worcester,Mass. T6	9.85
Worcester,Mass. J4	10.05

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE
(Continued)

WIRE, Tire Bead

Alton,Ill. L1	13.25
Bartonville,Ill. K4	13.25
Monessen,Pa. P16	13.15
Portsmouth,O. P12	13.15
Roebling,N.J. R5	13.45

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	7.95
Baltimore T6	8.25
Buffalo W12	7.95
Cleveland A7	7.95
Crawfordsville,Ind. M8	8.05
Dover,O. G6	7.95
Fostoria,O. S1	7.95
FranklinPark,Ill. T6	8.05
Kokomo,Ind. C16	8.05
Massillon,O. R8	7.95
Milwaukee C23	8.15
Monessen,Pa. P7, P16	7.95
Pawtucket,R.I. N8	8.25
Rome,N.Y.(32) R6	7.95
Trenton,N.J. R5	8.25
Worcester A7, T6, W12	8.25

NAILS, Stock

To Dealers & Mfrs. (7)	Col.
AlabamaCity,Ala. R2	.137
Aliquippa,Pa. J5	.137
Atlanta A11	.139
Bartonville,Ill. K4	.139
Chicago,Ill W13	.137
Cleveland A9	.142
Crawfordsville,Ind. M8	.139
Donora,Pa. A7	.137
Duluth,Minn. A7	.137
Fairfield,Ala. T2	.137
Galveston,Tex. D7	.145
Houston,Tex. S5	.142
Johnstown,Pa. B2	.137
Joliet,Ill. A7	.137
KansasCity,Mo. S5	.142
Kokomo,Ind. C16	.139
Minnequa,Colo. C10	.142
Monessen,Pa. P7	.137
Pittsburg,Calif. C11	.156
Rankin,Pa. A7	.137
So.Chicago,Ill. R2	.137
SparrowsPt.,Md. B2	.139
Sterling,Ill.(1) N15	.137
Worcester,Mass. A7	.143

NAILS, CUT (100 lb keg)

To Dealers (33)	
Conshohocken,Pa. A3	$8.30
Wheeling,W.Va. W10	8.30

STAPLES, Polished Stock

To Dealers & Mfrs. (7)	Col.
Aliquippa,Pa. J5	.138
Atlanta A11	.140
Bartonville,Ill. K4	.139
Crawfordsville,Ind. M8	.139
Donora,Pa. A7	.138
Duluth,Minn. A7	.138
Fairfield,Ala. T2	.138
Johnstown,Pa. B2	.138
Joliet,Ill A7	.138
Kokomo,Ind. C16	.139
Minnequa,Colo. C10	.142
Monessen,Pa. P7	.137
Pittsburg,Calif. C11	.157
Rankin,Pa. A7	.138
SparrowsPt.,Md. B2	.140
Sterling,Ill.(1) N15	.138
Worcester,Mass. A7	.144

TIE WIRE, Automatic Baler (14½ Ga.) (Per 97 lb Net Box)

Coil No. 3150	
AlabamaCity,Ala. R2	$8.77
Buffalo W12	8.77
Donora,Pa. A7	8.77
Duluth,Minn. A7	8.77
Joliet,Ill. A7	8.77
Minnnequa,Colo. C10	9.02
So.Chicago, Ill. R2	8.77

Coil No. 6500 Stand.	
AlabamaCity,Ala. R2	$9.05
Buffalo W12	9.05
Donora,Pa. A7	9.05
Duluth,Minn. A7	9.05
Joliet,Ill. A7	9.05
Minnequa,Colo. C10	9.30
So.Chicago,Ill. R2	9.05

Coil No. 6500 Interim	
AlabamaCity,Ala. R2	$9.10
Buffalo W12	9.10
Donora,Pa. A7	9.10
Duluth,Minn. A7	9.10
Joliet,Ill. A7	9.10
Minnequa,Colo. C10	9.35
So.Chicago,Ill. R2	9.10

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	.155
Atlanta A11	.157
Bartonville,Ill. K4	.157
Crawfordsville,Ind. M8	.157
Donora,Pa. A7	.155
Duluth,Minn. A7	.158
Fairfield,Ala. T2	.155
Joliet,Ill. A7	.155
Houston S5	.160
KansasCity,Mo. S5	.160
Kokomo,Ind. C16	.157
Minnequa,Colo. C10	.160
Pittsburg,Calif. C11	.179
So.SanFran.,Calif. C10	.179
SparrowsPoint,Md. B2	.157
Sterling, Ill.(1) N15	.155

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	.159**
Aliquippa J5	.156‡
Atlanta A11	.164
Bartonville,Ill. K4	.165
Crawfordsville,Ind. M8	.164
Donora,Pa. A7	.159†
Duluth,Minn. A7	.159†
Fairfield,Ala. T2	.159†
Houston,Tex. S5	.164†
Johnstown,Pa. B2	.162*
Joliet,Ill. A7	.159†
KansasCity,Mo. S5	.164†
Kokomo,Ind. C16	.161†
Minnequa,Colo. C10	.164**
Monessen,Pa. P7	.162
Pittsburg,Calif. C11	.179†
Rankin,Pa. A7	.159†
So.Chicago,Ill. R2	.159**
So.SanFrancisco C10	.179**
SparrowsPoint,Md. B2	.164*
Sterling,Ill.(1) N15	.163

WOVEN Fence, 9-15 Ga. Col.

Ala.City,Ala. R2	.146**
Ala.City, 17 ga. R2	.241**
Ala.City, 18 ga. R2	.251**
Aliq'ppa,Pa.9-14½ga.J5	149‡
Atlanta A11	.151
Bartonville,Ill. K4	.152
Crawfordsville,Ind. M8	.151
Donora,Pa. A7	.146†
Duluth,Minn. A7	.146†
Fairfield,Ala. T2	.146†
Houston,Tex. S5	.151†
Johnstown,Pa.(43) B2	.149
Joliet,Ill. A7	.146†
KansasCity,Mo. S5	.151†
Kokomo,Ind. C16	.148†
Minnequa,Colo. C10	.151**
Monessen,Pa. 9 ga, P17	.149
Pittsburg,Calif. C11	.169†
Rankin,Pa. A7	.146†
So.Chicago,Ill. R2	.146**
Sterling,Ill.(1) N15	.150

WIRE (16 Gage)

	An'ld Stone	Galv. Stone
Ala.City R2	13.15	14.70**
Bartonville K4	13.25	15.15
Buffalo W12	13.15	....
Cleveland A7	13.15	....
Crawf'dsville M8	13.25	15.10
Fostoria,O. S1	13.25	14.80†
Johnstown B2	13.15	15.00*
Kokomo C16	13.25	14.80†
Minnequa C10	13.40	15.10**
Palmer,Mass.W12	13.15	14.70†
Pitts.,Calif. C11	13.50	15.05†
So.Chicago R2	13.15	14.70
SparrowsPt. B2	13.25	15.10*
Sterling(1) N15	13.15	15.05
Waukegan A7	13.15	14.70†
Worcester A7	13.45	....

WIRE, Merchant Quality

(6 to 8 gage)	An'ld Galv.
Ala.City,Ala. R2	.6.90 7.30**
Aliquippa J5	.6.90 7.425‡
Atlanta A11	.7.00 7.55
Bartonville(48) K4	7.00 7.575
Buffalo W12	.6.90 7.30†
Cleveland A7	.6.90 ....
Crawfordsville M8	7.00 7.55
Donora,Pa. A7	.6.90 7.30†
Duluth,Minn. A7	.6.90 7.30†
Fairfield T2	.6.90 7.30†
Houston,Tex. S5	.7.15 7.55†
Jacks'ville,Fla. M8	7.425 7.95
Johnstown B2(48)	.6.90 7.45*
Joliet,Ill. A7	.6.90 7.30†
KansasCity,Mo. S5	7.15 7.55†
Kokomo C16	.7.00 7.40†
LosAngeles B3	.7.85 ....
Minnequa C10	.7.15 7.55**
Monessen P7 (48)	.6.90 7.45
Palmer,Mass. W12	.7.20 7.60†
Pitts.,Calif. C11	.7.85 8.25†
Portsmouth,O. P12	6.90 ....
Rankin A7	.6.90 7.30†
So.Chicago R2	.6.90 7.30**
So.S.Fran. C10	.7.85 8.25**
Spar'wsPt. B2(48)	.7.00 7.55*
Sterling(1)(48)	N15 6.90 7.475
Struthers,O.(48)	Y1 6.90 7.40‡
Worcester,Mass. A7	7.20 ....

*Based on 11c zinc; †5c zinc; ‡10c zinc; ‖Less than 10c zinc; **Subject to zinc equalization extras.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

Base discounts, per cent off list, f.o.b. midwestern plants)

½ in. and shorter:	
⅛-in. & smaller diam	2
Over 4 in. through 6 in.:	
⅛ in. & smaller diam	+3
¾ in. and shorter:	
⅞-in. and ⅝-in.	+4
⅞-in. and larger	+6
Longer than 6 in.:	
All diameters	+15
Lag bolts, all diams:	
6 in. and shorter	6
Over 6 in. long	+2
Ribbed Necked Carriage	+4
Blank	10
Plow	23
Step, Elevator, Tap and Sleigh Shoe	10
Tire Bolts	+3
Boiler & Fitting-Up Bolts	21

NUTS

H.P. and C.P., regular & heavy:	
Square, all sizes	56
H.P., Hex, regular & heavy:	
⅝" and smaller	55
⅞" to 1⅛", inclusive	58
1⅛" to 1⅜", inclusive	60
1⅜" and larger	55
C.P. Hex regular & heavy:	
All sizes	55
Hot Galv. Nuts (all types):	
⅝" or smaller	38
⅞" to 1⅛", inclusive.	41
Finished Hex Nuts:	
New standard, all sizes	56
Semifinished & Slotted Hex:	
Regular and heavy, all sizes	55

SQUARE HEAD SET SCREWS

(1035 steel; packaged; per cent off list)

1 in. diam x 6 in. and shorter	34
1 in. and smaller diam x over 6 in.	20

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	34
¼ in. diam & larger	14
N.F. thread, all diams.	8

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	43
Plated finishes	23

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
¼-in. through ⅝-in.	38
⅝-in. through 1 in.	15
Longer than 6 in.:	
¼-in. through ⅝-in.	20
⅝-in. through 1 in.	7

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 9.25
⅞-in. under..List less 37%

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	19.59	19.00
1¼	13	....	23.21	18.77
1½	13	21.40	25.65	20.75
1¾	13	25.28	30.31	24.52
2	13	23.33	33.97	27.48
2¼	13	31.91	38.26	30.95
2¼	12	34.63	41.52	33.59
2½	12	38.15	45.74	37.00
2¾	12	41.31	49.53	40.07
3	12	44.05	52.82	42.72

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Standard All	Toe Rails 60 lb Under
RAILS				
Bessemer,Pa. U5	4.45	4.35	4.40	5.35
Ensley,Ala. T2	4.45	4.35	...	5.35
Fairfield,Ala. T2	...	...	...	5.35
Gary,Ind. U5	4.45	4.35	4.40	...
IndianaHarbor,Ind. I-2	4.45	4.35	4.40	...
Johnstown,Pa. B2	...	...	...	(16)5.35
Lackawanna,N.Y. B2	4.45	4.35	...	5.35
Minnequa,Colo. C10	4.45	4.35	...	5.85
Steelton,Pa. B2	4.45	4.35	...	5.35
Williamsport,Pa. S10	...	...	...	5.35

TIE PLATES

Fairfield,Ala. T2	5.275
Gary,Ind. U5	5.275
Ind.Harbor,Ind. I-2	5.275
Lackawanna,N.Y. B2	5.275
Minnequa,Colo. C10	5.275
Seattle B3	5.425
Steelton,Pa. B2	5.275
Torrance,Calif. C11	5.425

TRACK BOLTS (20) Treated

Cleveland R2	11.50
KansasCity,Mo. S5	11.50
Lebanon,Pa. B2	11.50
Minnequa,Colo. C10	11.50
Pittsburgh O3, P14	11.50
Seattle B3	12.00

AXLES

Ind.Harbor,Ind. S13	6.75
Johnstown,Pa. B2	6.75

JOINT BARS

Bessemer,Pa. U5	5.425
Fairfield,Ala. T2	5.425
Ind.Harbor,Ind. I-2	5.425
Joliet,Ill. U5	5.425
Lackawanna,N.Y. B2	5.425
Minnequa,Colo. C10	5.425
Steelton,Pa. B2	5.425

SCREW SPIKES

Cleveland R2	11.00

STANDARD TRACK SPIKES

Fairfield,Ala. T2	7.30
Ind.Harbor,Ind. I-2, Y1	7.30
KansasCity,Mo. S5	7.30
Lebanon,Pa. B2	7.30
Minnequa,Colo. C10	7.30
Pittsburgh J5	7.30
Seattle B2	7.80
So.Chicago,Ill. R2	7.30
Struthers,O. Y1	7.30
Youngstown R2	7.30

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

Sponge iron:	Cents
98+% Fe, annealed	15.25
Unannealed:	
Minus 100 mesh	11.75
Minus 35 mesh	9.25
Minus 20 mesh	9.00
Swedish, c.l.f. N. Y., c.l., in bags	11.25
Domestic (Swedish), f.o.b. Riverton, N.J., in bags	9.50
Canadian, f.o.b. shipping point	9.50
Electrolytic iron:	
Melting stock, 99.91% Fe, irregular fragments of ⅛ in. x ⅛ in.	21.00
Annealed, 99.5% Fe	36.50
Unannealed (99+% Fe)	32.50
Unannealed (99+% Fe) (minus 325 mesh)	52.00
Powder Flakes (minus 16, plus 100 mesh)	31.00
Carbonyl iron: 97.9-99.8% size 5 to 10 microns	83.00-148.00
Aluminum:	
Atomized, 500 lb drums, frght. allowed Carlots	32.20
Ton lots	34.20
Antimony, 500 lb lots	32.00*
Brass, 5000-lb lots	31.25-39.75†
Bronze, 5000-lb lots	51.50-54.75†
Copper:	
Electrolytic	13.75*
Reduced	13.75*
Lead	7.50*
Manganese:	
Minus 35 mesh	61.00
Minus 100 mesh	67.00
Minus 200 mesh	72.00
Nickel, unannealed	97.00
Nickel-Silver, 5000-lb lots	47.50-51.00
Phosphor-Bronze, ¼-ton lots	58.50
Silicon	43.50
Solder	7.00*
Stainless Steel, 302	94.00
Stainless Steel, 316	$1.25
Tin	14.50*
Zinc, 5000-lb lots	17.25-31.00‡
Tungsten	Dollars
Melting grade, 99%	
60 to 200 mesh:	
1000 lb and over	4.95
Less than 1000 lb	5.10
Chromium, electrolytic 99.2% Cr min.	3.50

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 20% Zn, 10% Ni; **64% Cu, 18% Zn, 18% Ni.

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1¼" to 1 7/16"; 1 7/16" to 1 15/16" 4.75c; 1 15/16" to 7 5/16" 5.15c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 Ga. and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅝" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25 off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 4.95c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c for carbon, add 0.40c for alloy and 0.35c. H.S.-L.A.
(31) Widths over ⅝-in.; 6.40c for widths ⅝-in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 13 Ga. & heavier; 60" & narrower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. to mill zone or within switching limits, 5.10c.
(43) 9-14½ Ga.
(48) 6-7 Ga.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Sizes—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5
Ambridge, Pa. N2	13.5	..	17.5	...	20	...	21.5	...	21.5	...	20.75	...	23.25	...
Lorain, O. N3	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5
Youngstown Y1	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Alton, Ill. L1	...	...	....	....	....	....	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Benwood, W. Va. W10	24	+4.5	15.25	+10.25	7.25	+17.25	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Butler, Pa. F6	25	+3.5	17	+ 8.5	9.5	+16	....	..	....	...	....	...	....	....
Etna, Pa. N2	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Fairless Hills, Pa. N3	...	...	....	....	....	....	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Fontana, Calif. K1	...	...	....	....	....	....	10.75	+6.5	13.75	+2.5	16.25	1	18.75	2.25
Ind. Harbor, Ind. Y1	...	...	....	....	....	....	22.75	5.5	25.75	9.5	28.25	13	30.75	14.25
Lorain, O. N3	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Sharon, Pa. S4	25	+3.5	17	+ 8.5	9.5	+15	....	..	....	...	....	..	....	....
Sharon, Pa. M6	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Sparrows Pt., Md. B2	23	+5.5	15	+10.5	7.5	+17	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Youngstown R2, Y1	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Wheatland, Pa. W9	23	+5.5	15	+10.5	7.5	+17	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	...	....	...
Alton, Ill. L1	30.25	14.25	30.75	14.75	32.25	15	32.25	15	....	...	....	...
Benwood, W. Va. W10	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Etna, Pa. N2	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Fairless Hills, Pa. N3	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Fontana, Calif. K1	19.25	3.25	19.75	3.75	21.25	4	21.25	4	12.5	+5.25	12.5	+5.25
Ind. Harbor, Ind. Y1	31.25	15.25	31.75	15.75	33.25	16	33.25	16	24.5	6.75	25.5	6.75
Lorain, O. N3	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	...	....	...
Sharon, Pa. M6	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	...	....	...
Sparrows Pt., Md. B2	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Youngstown R2, Y1	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Wheatland, Pa. W9	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75

*Galvanized pipe discounts based on current price of zinc (12.00c; East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	Shapes; H.R. & C.F. H.R. Strip	Bars; Wire	Plates	Sheets	C.R. Strip; Flat Wire
301	16.75	21.00	30.00	34.75	30.25	35.75	37.75	41.75	38.75
302	17.75	23.25	30.25	35.00	32.50	36.00	38.00	42.00	42.00
302B	19.00	25.00	31.00	35.00	35.50	36.00	38.00	45.25	45.25
303	....	25.25	32.75	37.75	....	38.75	40.25	46.00	46.00
304	19.00	24.50	31.75	36.75	35.00	38.00	40.50	44.50	44.50
304L	....	....	36.75	41.75	40.00	43.00	45.50	49.50	49.50
305	20.50	26.50	33.50	37.25	38.00	38.00	41.00	47.50	47.50
308	20.75	27.25	36.25	41.75	39.00	43.00	47.00	49.00	49.00
309	27.75	36.00	44.00	50.50	50.50	51.75	55.00	63.25	63.25
309S	29.75	36.75	48.00	55.75	55.25	56.75	60.25	69.75	69.75
310	35.00	45.25	58.75	68.25	64.75	69.50	71.00	74.25	74.25
314	....	....	....	....	....	....	71.00	....	....
316	29.75	38.00	48.25	56.25	55.00	57.25	60.50	64.50	64.50
316L	....	....	53.25	61.25	60.00	62.25	65.50	69.50	69.50
317	35.00	45.50	59.25	68.75	69.50	70.25	72.75	79.00	79.00
321	23.50	30.25	36.00	41.50	41.75	42.75	46.50	51.25	51.25
330	....	....	61.50	....	....	72.00	73.25	81.25	81.25
18-SCbTa	29.25	38.25	46.00	52.25	53.00	53.75	58.50	66.50	66.50
403	....	....	27.00	30.75	....	32.00	34.25	....	....
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	39.75	39.75
410	14.00	18.25	24.00	27.25	26.25	28.75	30.00	34.25	34.25
414	....	....	24.50	....	....	29.25	30.50	35.25	35.25
416	....	....	24.50	28.25	....	29.25	....	....	....
420	22.00	28.50	29.25	34.00	33.50	35.00	38.50	52.75	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	34.75	34.75
430F	....	....	25.00	28.75	....	29.75	....	....	....
431	15.00	19.25	25.00	28.75	28.00	29.75	31.00	35.75	35.75
446	....	....	33.50	38.25	50.25	39.50	40.75	59.75	59.75

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; Alloy Tube Div., Carpenter Steel Co.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Josyin Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Tube Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Sawhill Tubular Products Inc.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Uibrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

	Plates, Carbon Base 10%	Plates, Carbon Base 20%	Sheets, Carbon Base 20%
Stainless:			
302	....	....	28.00
304	28.30	33.60	29.75
304-L	30.30	35.50	....
310	41.30	47.00	....
316	33.40	38.80	42.75
316-L	37.80	43.30	....
316-CB	38.90	45.50	....
321	30.00	35.30	34.25
347	32.20	38.60	44.25
405	23.90	31.10	....
410	23.40	30.60	....
430	23.40	30.60	24.25
Inconel	47.90	63.90	....
Nickel	39.50	54.10	....
Monel	40.80	54.80	....
L-Nickel	41.70	58.50	....
Copper*	....	....	46.00

	Strip, Carbon Base, Cold Rolled 10%	Strip, Carbon Base, Cold Rolled Both Sides
Copper*	26.60	33.00

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.26	5% Cr Hot Work	0.405
Extra Carbon	0.31-.315	W-Cr Hot Work	0.425
Special Carbon	0.37	V-Cr Hot Work	0.445
Oil Hardening	0.405	Hi-Carbon-Cr	0.73

Grade by Analysis (%)

W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	...	4.030
18.25	4.25	1	4.75	...	2.245-2.415
18	4	2	9	...	2.615
18	4	2	....	...	1.705
18	4	1	....	...	1.540
14	4	2	5	...	2.185
13.75	3.75	2	5	...	2.185
13.5	4	3	....	...	1.805
9	3.5	..	....	...	1.115
6	4	2	....	5	1.045
6	4	3	....	6	1.290
1.5	4	1	....	8.5	0.900

Tool steel producers include; A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

Birmingham District	Basic	No. 2 Foundry	Malle-able	Besse-mer
AlabamaCity,Ala. R2	52.38	52.88	....	....
Birmingham R2	52.38	52.88	....	....
Birmingham U6	....	52.88	56.50†	....
Gadsden,Ala. R2	52.38	52.88	....	....
Cincinnati, deld.	....	60.58	....	....
Buffalo District				
Buffalo H1, R2	56.00	56.50	57.00	57.50
Tonawanda,N.Y. W12	56.00	56.50	57.00	57.50
No.Tonawanda,N.Y. T9	....	56.50	57.00	57.50
Boston, deld.	66.65	67.15	67.65	....
Rochester,N.Y., deld.	59.02	59.52	60.02	....
Syracuse,N.Y., deld.	60.12	60.62	61.12	....
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Chicago R2	56.00	....	56.50	....
Gary,Ind. U5	56.00	....	56.50	....
IndianaHarbor,Ind. I-2	56.00	....	56.50	....
So.Chicago,Ill. W14, Y1	56.00	56.50	56.50	....
So.Chicago,Ill. U5	56.00	....	56.50	57.00
Milwaukee, deld.	58.17	58.67	58.67	59.17
Muskegon,Mich., deld.	....	62.80	62.80	....
Cleveland District				
Cleveland A7, R2	56.00	56.50	56.50	57.00
Akron,O., deld.	58.75	59.25	59.25	59.75
Lorain,O. N3	56.00	....	....	57.00
Mid-Atlantic District				
Bethlehem,Pa. B2	58.00	58.50	59.00	59.50
NewYork, deld.	....	62.28	62.78	....
Newark, deld.	61.02	61.52	62.02	62.52
Birdsboro,Pa. B10	58.00	58.50	59.00	59.50
Chester,Pa. C31	....	48.50	49.00	....
Philadelphia, deld.	....	50.16	50.66	....
Steelton,Pa. B2	58.00	58.50	59.00	59.50
Swedeland,Pa. A3	58.00	58.50	59.00	59.50
Philadelphia, deld.	59.66	60.16	60.66	61.16
Troy,N.Y. R2	58.00	58.50	59.00	59.50
Pittsburgh District				
Nevillelsland,Pa. P6	56.00	56.50	56.50	57.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	57.87	57.87	58.37
McKeesRocks, deld.	....	57.54	57.54	58.04
Lawrenceville,Homestead, Wilmerding,Monaca, deld.	....	58.16	58.16	58.66
Verona,Trafford, deld.	58.19	58.69	58.69	59.19
Brackenridge, deld.	58.45	58.95	58.95	59.45
Bessemer,Pa. U5	56.00	....	56.50	57.00
Clairton,Rankin,So.Duquesne,Pa. U5	56.00	....	....	....
McKeesport,Pa. N3	56.00	....	....	57.00
Midland,Pa. C18	56.00	....	....	....

Youngstown District	Basic	No. 2 Foundry	Malle-able	Besse-mer
Hubbard,O. Y1	....	....	56.50	....
Sharpsville,Pa. S6	56.00	56.50	56.50	57.00
Youngstown Y1	....	....	56.50	57.00
Youngstown U5	56.00	....	....	57.00
Mansfield,O., deld.	60.90	....	61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie,Pa. I-3	56.00	56.50	56.50	57.00
Everett,Mass. E1	60.50	61.00	61.50	....
Fontana,Calif. K1	62.00	62.50	....	....
Geneva,Utah C11	56.00	56.50	....	....
GraniteCity,Ill. G4	57.90	58.40	58.90	....
Ironton,Utah C11	56.00	56.50	....	....
LoneStar,Texas L6	62.00	52.50*	52.50	....
Minnequa,Colo. C10	58.00	59.00	59.00	....
Rockwood,Tenn. T2	....	52.50*	56.50	....
Toledo,O. I-3	56.00	56.50	56.50	57.00
Cincinnati, deld.	61.76	62.26	....	....

*Low phos, southern grade. †Phos, 0.30 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.5% Si; 75 cents for each 0.50% Mn over 1%)

Jackson,O. G2, J1	$65.00
Buffalo H1	66.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.50 Si to 18%; $1 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls,N.Y. P15	$80.50
Keokuk,Iowa, (Open-hearth & Fdry, freight allowed K2)	85.00
Keokuk, O.H. & Fdry, 12½ lb piglets, 16% Si, frgt allowed K2	88.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland A7 (Intermediate)	$61.00
Lyles,Tenn. T3	70.00
Rockwood,Tenn. T3	70.00
Steelton,Pa. B2	64.00
Philadelphia, deld.	67.55
Troy,N.Y. R2	64.00

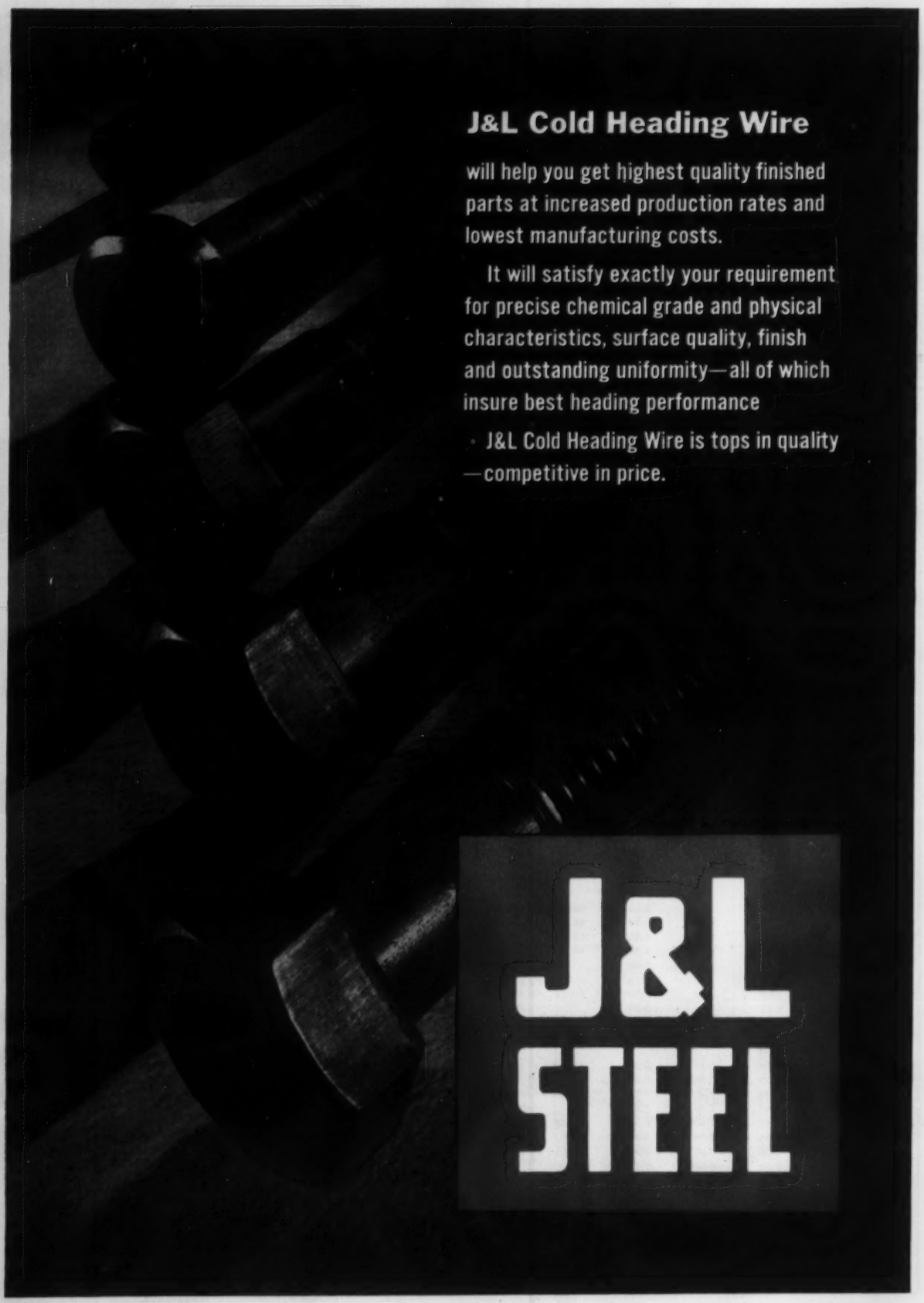
Warehouse Steel Products

Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except Buffalo, 25 cents; Birmingham and St. Paul, 15 cents; Philadelphia, New York, Boston and Los Angeles, 10 cents; Houston, Seattle, Spokane, Wash., no charge.

	SHEETS				STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Gal. 10 Ga.†	Stainless Type 302†‡	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††[3]		Carbon	Floor
Baltimore	6.02	7.51	7.79	....	6.69	...	6.68	8.02[6]	12.54	6.72	6.37	7.76
Birmingham	6.35	7.35	8.25[3]	....	6.60	...	6.50	9.10	....	6.65	6.65	8.46
Boston	7.23	8.23	9.57	45.28[5]	7.47	...	7.20	8.60	12.60	7.49	7.37	8.50
Buffalo	6.30	7.40	8.84	....	6.65	...	6.45	7.40	12.30	6.67	6.60	7.85
Charlotte, N. C.	6.95	7.80	8.69	....	6.90	...	7.10	8.37	....	7.10	7.10	8.37
Chicago	6.38	7.38	8.30	46.06	6.62	...	6.51	7.25	12.05	6.69	6.52	7.64
Cincinnati	6.49	7.37	8.30	46.10	6.86	...	6.75	7.55	12.30	6.86	6.81	7.89
Cleveland	6.38	7.38	8.25	46.16	6.72	...	6.57	7.35	12.11	7.02	6.69	7.81
Detroit	6.57	7.57	8.58	43.50	6.90	7.36	6.79	7.54	12.25	7.16	6.80	7.83
Erie, Pa.	6.35	7.38	8.30	....	6.70	...	6.50	7.45[4]	....	6.69	6.52	7.64
Houston	7.35	7.80	9.99	....	7.70	9.30	7.70	9.30	....	7.60	7.35	8.75
Los Angeles	7.50	9.35	9.95	50.15	7.85	11.75	7.45	10.15	13.45	7.65	7.45	9.55
Milwaukee	6.47	7.47	8.39	....	6.71	...	6.60	7.44	12.14	6.86	6.61	7.73
Moline, Ill.	6.73	7.73	8.65	....	6.97	...	6.86	7.60	....	7.04	6.87	...
New York	6.97	7.91	8.79	44.95	7.56	...	7.37	8.73[6]	12.43	7.38	7.27	8.68
Norfolk, Va.	7.00	...	...	....	7.10	...	7.10	8.60	....	7.10	7.10	7.95
Philadelphia	6.19	7.44	8.26	41.98[5]	6.96	8.80	6.74	7.86[6]	12.26	6.54	6.49	7.51**
Pittsburgh	6.38	7.38	8.30	46.00	6.72	...	6.51	7.35	12.05	6.69	6.52	7.64
Portland, Oreg.	7.00	7.75	9.10	48.50	7.25	...	7.05	10.20	14.00	7.00	6.85	8.75
Richmond, Va.	6.43	7.39	8.67	....	6.77	...	6.71	8.33	....	7.08	6.65	8.08
St. Louis	6.67	7.67	8.59	43.89	6.91	...	6.80	7.64[6]	12.34	7.09	6.81	7.93
St. Paul	7.04	8.04	8.96	....	7.28	...	7.17	8.01	....	7.35	7.18	8.30
San Francisco	7.55	8.95	9.45	51.65	7.80	...	7.35	10.05	13.35	7.50	7.40	9.45
Seattle	8.10	9.80	10.15	51.00	8.20	...	7.80	10.95	13.80	7.75	7.80	9.60
Spokane	8.35	9.65[7]	10.15	....	7.80	...	7.80	10.85[4]	14.55	7.45	7.55	9.60
Washington	6.70	7.99	7.97	....	7.37	...	7.38	9.09	....	7.31	7.05	8.16

*Prices do not include gage extras; †prices include gage and coating extras, based on 11.50-cent zinc except in Birmingham (coating extra excluded); ‡includes 35-cent special bar quality extras; **¼-in. and heavier; ††as annealed; ‡‡prices include $2 for crating; §§under ½-in.

Base quantities, 2000 to 4999 lb except as noted: Cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb; stainless sheets, 8000 lb except in New York and Boston, 10,000 lb, and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb; [3]—500 to 9999 lb; [4]—4000 lb and over; [5]—1000 to 1999 lb; [6]—1000 lb and over; [7]—1500 to 3999 lb; [8]—2000 to 3999 lb; [9]—f.o.b. local delivery in lots of 10,000 lb and over.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will help you get highest quality finished parts at increased production rates and lowest manufacturing costs.
It will satisfy exactly your requirement for precise chemical grade and physical characteristics, surface quality, finish and outstanding uniformity—all of which insure best heading performance
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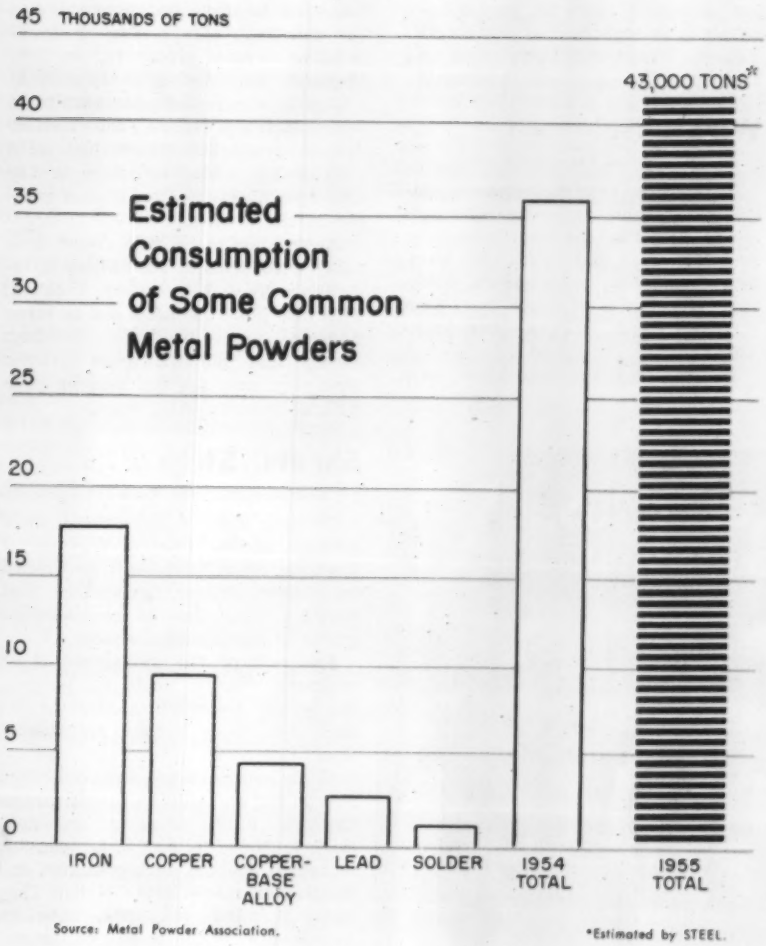

Source: Metal Powder Association.

*Estimated by STEEL.

Metal Powders Set Record Pace

METAL POWDERS are being pressed into service at record pace and could end up the year about 21 per cent ahead of 1954 in total shipments.

On the basis of this first-quarter activity reported by the Metal Powder Association, STEEL estimates total shipments will reach close to 43,000 tons in 1955 (see chart above). This assumes a relatively strike-free summer. If the first-quarter pace were to persist over the year, the total for the five powders above would be about 44,750 tons. But even if there are no major strikes, it is doubtful that the second half will equal the first. A slowdown in the auto industry alone would spoil any chances of setting such a record.

Nearly Double—Robert L. Ziegfeld, secretary-treasurer of MPA, says that iron powder producers, the largest segment of the industry, shipped at the annual rate of nearly 11,000 tons during the last quarter, 1954. First quarter, 1955, shipments climbed almost 82 per cent, to an annual rate of 20,000 tons. Even with that growth, there is no fear within the industry that production will outstrip capacity, which is over 50,000 tons. This industry is geared for growth.

Mr. Ziegfeld also says that copper powder shipments in the first quarter were running at a peak annual rate of 13,500 tons a year, well above the previous high level of 12,000 tons in 1950. Copper-base alloy powder shipments are about half as large as copper powder shipments. Lead powder is being shipped at an annual rate of about 3500 tons, and solder powders are shipped at the rate of close to 1000 tons a year. In addition, there are numerous other metal powders for which totals are not available. MPA lists 27 kinds.

Contributing Factors — Contributing to the growth is the expanding use of metal powders. But the largest factor—and getting larger each year—is bearings and parts, which in 1954 accounted for about two-thirds of total shipments of the five leading powders. Most of the copper and copper-alloy powders and about half the iron powders are consumed by users in this category. Friction materials, magnetic cores, graphite metal brushes and lubricants are other major uses. Mr. Ziegfeld says that strong growth for metal powders lies in electronics where iron powder magnetic cores are used. Color television will play an important part in this.

The industry has its problems. Two of the most important are the need for more good powder metallurgists and the education of engineers who could make use of powder metallurgy.

Proof—That the industry is overcoming these problems seems evident from the fact that MPA's membership in ten years has grown from about 15 to over 70 companies.

Steel Bars . . .

Bar Prices, Page 150

Mill delivery promises on hot-rolled carbon bars fall largely in August. Pressure on the part of consumers, however, is more on shipments against existing orders than on getting additional tonnage in producers' rolling schedules.

Efforts to get deliveries on tonnage already placed with the mills is evident in most steel product lines. In bars, buyers for the most part have inventories fairly well built up, what with the tonnage they have under definite contract. What they chiefly are interested in is getting as much tonnage as possible delivered before mill prices undergo an increase, probably early in the third quarter. At least, they want the tonnage promised them for delivery before June 30. So far, most producers have been able to meet delivery promises.

Hot-rolled carbon bar business is brisk at Philadelphia, though some bar size angles and flats can still be had for July shipment. Cold-drawn bar requirements have increased substantially over recent weeks, but demand is beginning to level off in

the district. Where hot stock is on hand, cold finishers can make deliveries within three to seven weeks.

Orders are still increasing at Pittsburgh, coming to the mills from a wide variety of consumers. Included are some for fourth quarter delivery. Demand is heavy for forging applications.

In New England hot-rolled carbon bars are not available before August in the case of some producers and deliveries on more sizes now extend to September. Cold drawers are short of hot stock for capacity operations, and their stock lists for July will be much depleted. Demand for carbon and alloy bars in the district reflects the high rate of metalworking operations, with forge shops and screw machine products leading.

Wire . . .

Wire Prices, Pages 152 & 153

Installation and replacement contracts for cable and wire rope railing in New England total more than $300,000. National Fence Co., Meriden, Conn., has one contract, $109,753; Webster & Webster Inc., East Hartford, Conn., has the other, $147,339.

Demand for manufacturers wire continues to show improvement, but the merchant wire pickup is disappointing to most producers. In New England, wire buying is reported at a slightly accelerated pace, with most June capacity taken for heavier volume products. Orders for third quarter are ahead of those in the corresponding period for second quarter in the area.

Many consumers still crowd lead time, with demand for shipment indicating limited inventory building. This also holds for nails and in other finished wire products, heading, spring and manufacturers grades. Fine wire sizes are not keeping pace with demand in other items.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 151 & 152

Starting July 1, galvanized sheet activity at the Canton, O., mill of Republic Steel Corp. will be limited to culvert sheets, galvanized flat sheets heavier than 16 gage and all gages of galvannealed sheets.

The rest of the galvanized sheet products will be made at Warren, O., where Republic is starting its new, continuous hot-dip galvanizing line.

While sellers of hot and cold-rolled sheets see no letup in specifications through July (barring an auto strike), they do see some possible easing in demand during August and September, maybe into October. They have in mind, primarily, auto requirements with work on model changeovers beginning in August.

Seasonal influences—vacations and hot weather—may cause some tapering in demand from other directions as well. A major Pittsburgh area producer, however, is basing its production plans on an anticipated third quarter dip in demand of no more than 10 per cent from the second quarter.

Producers, generally, see plenty of demand ahead. For one thing, they have good order backlogs, and there will be a substantial carryover from second to third quarter. In fact, it is estimated at least one month of production may be required to care for the overflow.

Meanwhile, delivery promises on hot and cold-rolled sheets are largely for September. Galvanized mills are booked solidly through August and into the following month. Specialties, such as electrical sheets, enameling stock and stainless grades, are in booming demand. One Midwest mill is out of the market on all three for the third quarter. Fear of further tightening in nickel supply is spurring demand for 18-8 stainless

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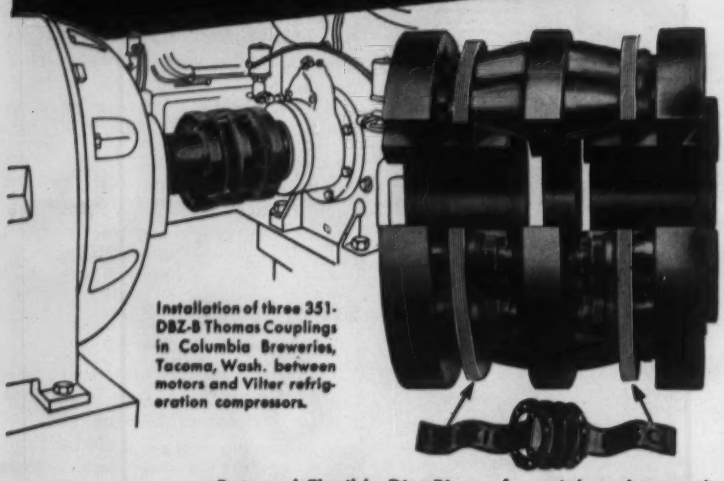
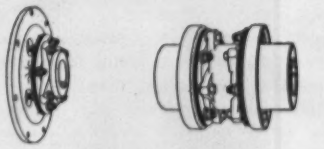


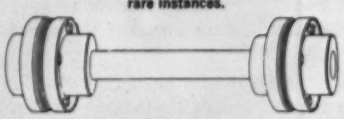
Installation of three 351-DBZ-B Thomas Couplings in Columbia Breweries, Tacoma, Wash. between motors and Vilter refrigeration compressors.

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

DISTINCTIVE ADVANTAGES	
FACTS	EXPLANATION
NO MAINTENANCE	Requires No Attention. Visual Inspection While Operating.
NO LUBRICATION	No Wearing Parts. Freedom from Shut-downs.
NO BACKLASH	No Loose Parts. All Parts Solidly Bolted.
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained.



Thomas Couplings are made for a wide range of speeds, horsepower and shaft sizes and can be assembled or disassembled without disturbing the connected machines, except in rare instances.



Write for our new Engineering Catalog No. 51A

THOMAS FLEXIBLE COUPLING COMPANY
Largest Exclusive Coupling Manufacturer in the World
WARREN, PENNSYLVANIA, U.S.A.

sheets, largely from jobbers through which the bulk of such tonnage is distributed.

There is no indication at Chicago and Cleveland and other Midwest points, such as St. Louis and Middletown, O., that demand for sheets is about to turn downward. Producers at those points, of course, anticipate some lessening in pressure next quarter, but, at present, consumers are pressing for all the tonnage they can get, especially cold-rolled sheets. In New England, cold-rolled buyers find most producers' third quarter schedules virtually filled.

Manufacturers of air-conditioning units are taking heavy quantities of galvanized and plain carbon sheets despite the fact they are beginning to taper off on operations. Commercial refrigeration requirements are active, and stovemakers are taking all the sheet tonnage they can get.

Plates . . .

Plate Prices, Page 150

Sheared plate deliveries extend into August, with some mills having little space left in schedules for that month and refusing to accept tonnage for delivery beyond. Some universal mill tonnage, however, is still available for delivery in July.

Generally, producers anticipate high operations throughout the third quarter. One Pittsburgh mill has informed its customers it will have to institute a modified quota system for deliveries in the period.

Although supply is tight and the mills are behind on deliveries in the Midwest, fabricators are able to maintain shop schedules. The working inventory of plates, as well as structurals, is greatly reduced in the Chicago area. Plate fabricators there have good order books for the third quarter, and they think fourth quarter business will hold up well.

Heavier orders for plates are being placed for third quarter shipment by New England fabricators. Openings in mill schedules for August are dwindling, however, except for the narrower widths. More district consumers are placing September tonnage, with tank and structural requirements strong.

Small tonnages required for seasonal work has improved the position of plate fabricators in the Pacific Northwest. Competition for business continues keen in the district, and while the over-all situation appears firmer, prices are low. No large contracts have been placed with the smaller shops recently. Pending lots in the area include 1000 tons for the Tacoma, Wash., Mayfield dam penstocks.

Tin Plate . . .

Tin Plate Prices, Page 152

Metal can shipments in March totaled 307,939 tons, compared with 259,585 in February and 291,392 in March, 1954, reports the U. S. Census Bureau. Shipments for the first quarter were 846,282 tons, against 816,342 in the like period last year.

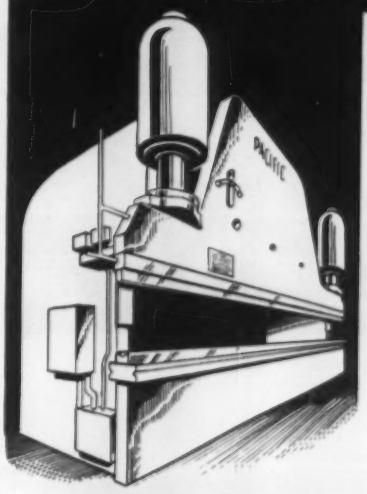
During the first quarter, a substantial increase in shipments for the fruit and vegetable pack was noted—191,545 tons, compared with 170,944 in the first three months of 1954; also in beer cans, 134,549 tons, against 116,255.

Steel shipping barrels and drums totaled 3,060,141 units in March, 19 per cent above February and 7 per cent above March, 1954. Shipments of steel shipping packages, kegs and pails, totaling 6,413,013 units, showed an even greater gain in March, compared with February—28 per cent.

Cumulative total for the January-March period for barrels and drums was 8,211,725, against 7,731,283 in the same 1954 period. Cumulative total for the first quarter for steel shipping packages, kegs and pails was 16,649,134, against 16,945,675.

Canners are pressing the mills for tin plate. They are not concerned

Versatility



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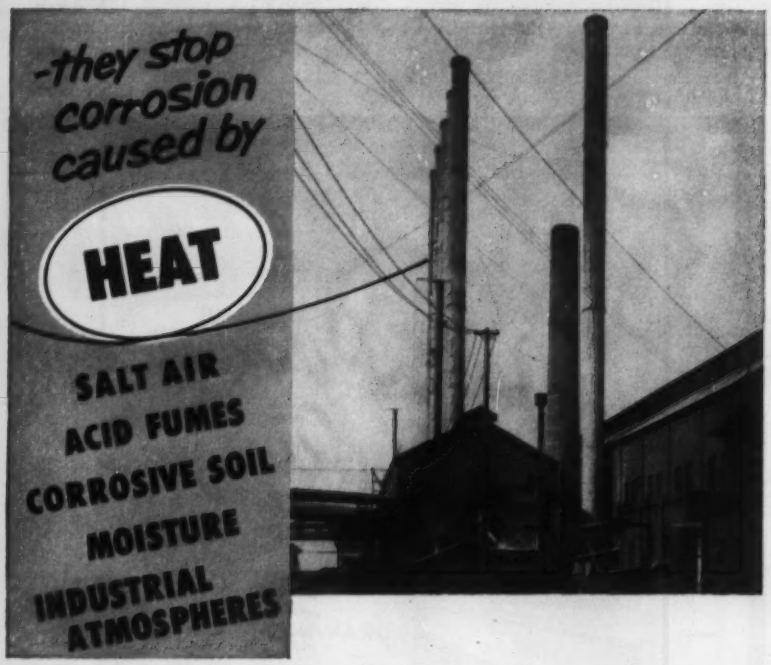

TOUGH CORROSION PROBLEMS can be solved, but not by using ordinary paints or conventional protective coatings. For long-term protection, it takes *specialized* protective coatings . . . the Bitumastic Coatings Koppers makes.

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No one coating can stop all kinds of corrosion. Therefore, Koppers makes an entire family of Bitumastic Protective Coatings. Send for free booklets describing them. At the same time, tell us about *your* corrosion problem so that we can recommend a method for its satisfactory solution. There is no obligation, of course.

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about prices, since they are protected by contracts until Oct. 1, but they are concerned over the chance of a steel strike, which would come at just about the time the fruit and vegetable season is nearing its peak.

Tubular Goods . . .

Tubular Goods Prices, Page 154

Electricweld pipe producers are well sold up through the third quarter. They already are booking some early fourth quarter orders. Construction requirements continue heavy. Most other tubular goods can be obtained more quickly, although oil country tube producers have backlogs extending a couple months.

One large buttweld producer at Pittsburgh says May order books are well filled, but it has open space in June schedules. Customers continue to press for quick shipments. The third quarter outlook generally is considered favorable, however.

Contracts totaling $11.236 million have been placed with firms in Texas, Oklahoma and Wyoming for construction of 655 miles of gas pipeline from Ignatius, Colo., to Burley, Idaho. The awards are for the first section of a proposed 1466-mile line which will bring natural gas to the Pacific Northwest.

The city of Seattle has called for bids on May 24 for 40,000 lb of ¾-in. galvanized steel pipe and 45,700 lb of couplings.

Warehouse . . .

Warehouse Prices, Page 155

Demand for warehouse steel continues active, with May volume abreast that of April. Prospects for June are equally good.

Distributors are placing forward orders with mills through September. The volume is larger and covers more products, including bars, plates, structurals and cold-rolled sheets. Inventories of these products, classified as the tightest, could be depleted rapidly were the distributors to accommodate users who normally get their major supplies from mills but who are turning to warehouses as mill shipments lag.

Specialty warehouses in the Metropolitan New York area are booking about 10 per cent more than in the first quarter; general line distributors, about 15 per cent. One leading warehouse no longer stocks straight chromium stainless sheets; orders are being placed with mills. Chromium stainless bars are stocked, but the return to nickel-bearing grades by users formerly taking sub-

(*Please turn to page* 165)

DO YOU NEED ADDED MANUFACTURING FACILITIES or ENGINEERING ASSISTANCE:

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Write to Contract Service Division—***Sheffield Corporation, Dayton 1, Ohio, U. S. A.***

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MANUFACTURE AND MEASUREMENT FOR MANKIND

Current Ferroalloy Quotations

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si), Carlot per gross ton $86, Palmerton, Pa.; $87 Clairton and Duquesne, Pa.
(16 to 19% Mn) $84 per ton, Palmerton, Pa.; $85 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.). Base price per net ton $190, Clairton, Duquesne, Johnstown and Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, Philo, O.; Sheffield, Ala.; Portland, Oreg., and Tacoma, Wash. Add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%) Lump $198 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 76%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 29.95c per lb of contained Mn, carload packed 30.7c, ton lots 31.8c, less ton 33c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max, 0.30% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P. 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lots 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carloads. 30c; 2000 lb to min carloads, 32c; 250 lb to 1999 lb 34c. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-85%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 11.00c per lb of alloy, carload packed 11.75c, ton lots 12.65c, less ton 13.65c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%. Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 24.75c per lb of contained Cr; c.l. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, C 0.025% max. (Simplex 34.50c per lb contained Cr, 0.03% C 34.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered, Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%). Contract, c.l. S M x D, bulk, 26.25c per lb contained Cr. Packed, c.l. 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low-Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, S M x D, 18.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 24.75c per lb of contained chromium plus 12c per pound of contained silicon; 1" x down, bulk 24.90c per pound of contained chromium plus 12.2c per pound of contained silicon, F.o.b. plant; freight allowed to destination.

Chromium Metal: (Min 97% Cr and 1% Fe). Contract, 1" x D; packed, max 0.50%, carload $1.16, ton lots $1.18; less ton $1.20. Delivered. Spot, add 5c. Prices on 0.10 per cent carbon grade, add 9c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 50-55%, Si 2-3.5% max, C 0.5-1% max) $3.10. **Primos and High Speed Grades** (V 50-55%, Si 1.50% max, C 0.20% max) $3.20.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 85c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12c per lb of contained Si, carload packed 13.6c, ton lot 15.5c, less ton 16.7c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.7c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per pound contained silicon; carload packed 14.85c; ton lots, 16.05c; less ton, 17.4c, delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.4c per lb of contained Si, carload packed 15.7c, ton lot 16.85c, less ton 18.1c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 17.25c per lb of contained Si, carload packed 18.45c, ton lot 19.4c, less ton 20.45c. Delivered. Spot, add 0.25c.

Silicon Metal: (Mn 97% Si and 1% max Fe). C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max, 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer. (Approx. 20% Al, 40% Si, 40 Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.25c per lb of alloy, ton lots packed 10.15c, 200 to 1999 lb 10.50c, smaller lots 11c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max). Contract, c.l. lump, bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 25.25c per lb of alloy, ton lot 26c, less ton 27.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min M) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5%-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%). Contract, lump, carloads 9.50c per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.05c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.65c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 11.85c per lb of briquet, c.l. packaged 12.85c, ton lot 13.65c, less ton 14.55c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.45c per lb of briquet, c.l. packaged 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.55c per lb of briquet. Packed c.l. 7.55c, ton lot 8.35c, less ton 9.25c. Delivered. Spot, add 0.25c.

(Small size—Weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.7c. Packaged c.l. 7.7c, ton lot 8.5c, less ton 9.4c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $3.80 per lb of contained W; 2000 lb W to 5000 lb W, $3.90; less than 2000 lb W, $4.02, f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, $12 per lb of contained Cb, less ton $12.05. Delivered. Spot, add 10c.

Ferrotitanium—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $6.25 per lb of contained Cb plus Ta, deld.; less ton lots $6.30.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carloads packed 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed, ¼" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%), C.l. packed, 17.50c per lb of alloy, ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 16.6c per lb of alloy; ton lots 18.10c; less ton lots 19.35c, f.o.b. Niagara Falls; freight allowed to St. Louis.

Siminal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 15.50c. Packed c.l. 16.50c, 2000 lb to c.l. 16.75c, less than 2000 lb 17.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Sigio, Tenn., $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, in 200-lb containers, f.o.b. Langeloth, Pa., $1.46 in all sizes except powdered which is $1.57; Washington, Pa., furnace, any quantity, $1.46.

Technical Molybdic-Oxide: Per lb contained Mo, f.o.b. Langeloth, Pa., $1.25 in cans; in bags, $1.24, f.o.b. Langeloth, Pa.; Washington, Pa., $1.24.

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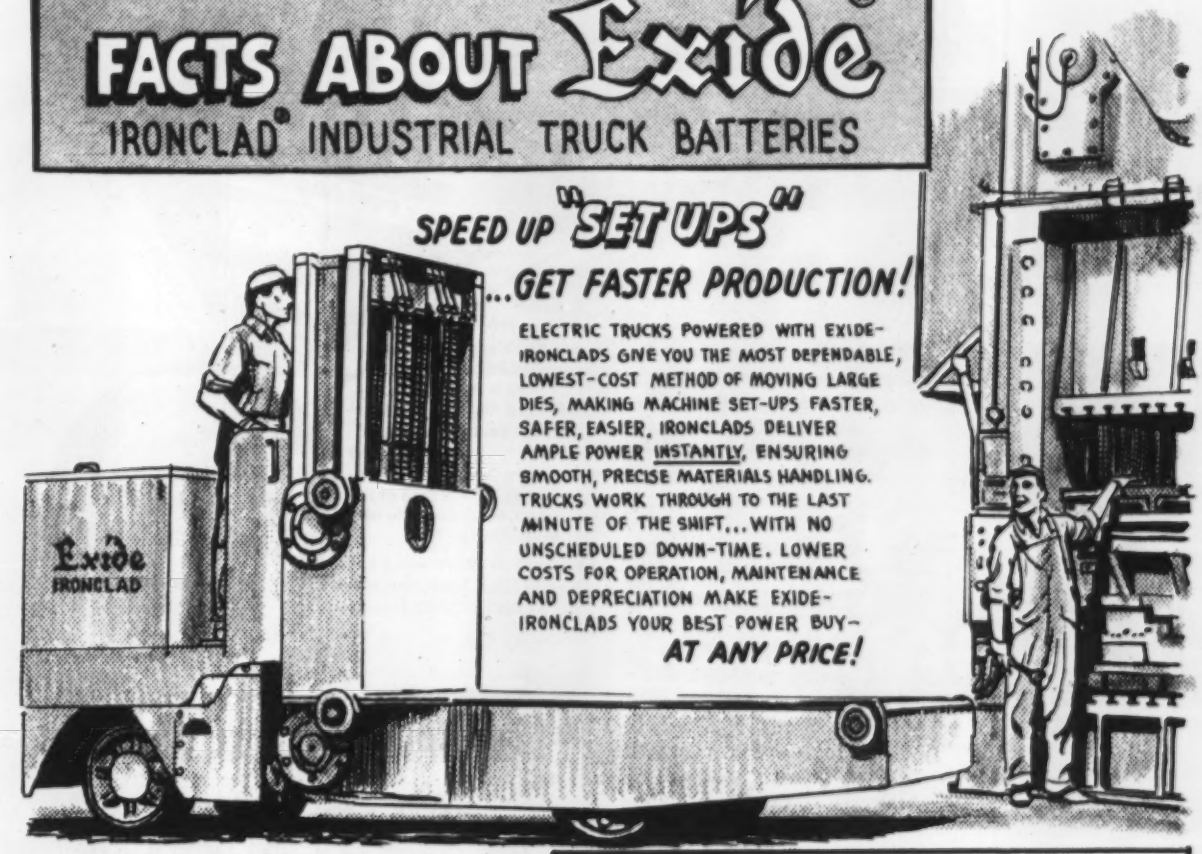

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COMPRESSED ACTIVE MATERIAL
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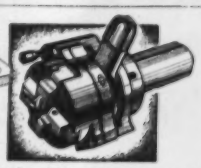

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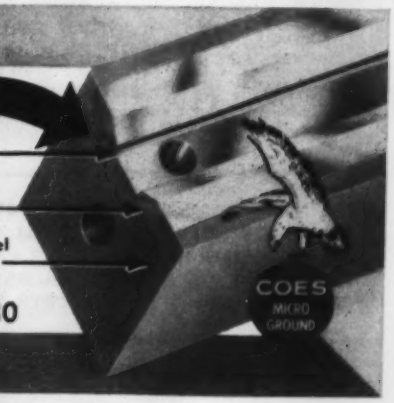
COES KNIFE COMPANY, Worcester, Mass.- Est. 1830

- Tool Steel for HARDNESS
- Forge Welded for STRENGTH
- Machineable Steel for TOUGHNESS



(*Concluded from page* 160)

stitutes is about complete, despite the acute shortage of nickel.

Price competition is keen in the Los Angeles district, particularly on galvanized sheets.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 165

Anticipating July vacation closings, some foundries are beginning to reduce coke inventories. This is particularly noted in the Chicago market where shipments of oven foundry coke in May are running slightly behind those in April. Further decline is likely in June. Unlike pig iron, coke is in free supply and is available for prompt shipment.

Pig Iron . . .

Pig Iron Prices, Page 155

Consumers are more interested in receiving tonnage due them from the steel mills than they are in placing more tonnage on production schedules of mills—tonnages that can't possibly be handled until some weeks away.

An exception is found in pig iron. Last year there was no increase in iron prices, following the steel wage advance, but this time buyers are sure there will be. They are stepping up specifications beyond current requirements and are finding that furnaces are in a position to accept the additional tonnage for delivery in this quarter. There is no stampede.

Shipments of pig iron to foundries this month are substantial and books for June suggest that deliveries in the month will continue the pace. July undoubtedly will show some slackening because of foundry vacation closings.

Improvement in consumption is not keeping pace with the increase in shipments, indicating some stockpiling in anticipation of higher prices.

In the Chicago district, 41 of the 43 blast furnaces are operating. This is the highest rate since July, 1953.

Iron Ore . . .

Iron Ore Prices, Page 165

Iron ore is moving down the lakes in much greater volume than a year ago. Shipments in the week ended May 16 totaled 2,581,514 gross tons, with daily loading averaging 368,788 tons, reports the Lake Superior Iron Ore Association. This compares with 1,972,969 tons and average daily loading of 281,853 tons in the like week of the 1954 shipping season.

Cumulative shipments to May 16 this year were 9,034,340 tons. This

Ores

Lake Superior Iron Ore

(Prices effective for the 1955 shipping season; gross ton, 51.50% iron natural, rail of vessel, lower lake ports)

Old range bessemer	$10.40
Old range nonbessemer	10.25
Mesabi bessemer	10.25
Mesabi nonbessemer	10.10
Open-hearth lump	11.25
High phosphorus	10.00

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

Foundry and basic 52-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60-68%	20.00
N. African hematite (spot)	nom. 18.00-20.00
Brazilian iron ore, 68-69% (spot)	24.00-26.00

Tungsten Ore

Net ton unit, before duty

Foreign, wolframite, good commercial quality	$25.00-$26.00
Domestic, scheelite, mine	63.00

Manganese Ore

Mn 48%, nearby, 85c-87c per long ton unit, c.i.f. U. S. ports, duty for buyer's account; 46-47%, 75c-80c.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and African

48% 2.8:1	nom. $40.00-$52.00
48% 3:1	42.00-44.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$19.00-$20.00
48% no ratio	31.00-32.00

Domestic

Rail nearest seller

18% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked	$1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

56-60%	$3.25-$3.80
65%	4.15-4.25

Vanadium Ore

Cents per lb V_2O_5 content, deld. mills

Domestic	31.00

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Pueblo, Colo., $94; Ashland, Grahn, Hayward, Hitchins, Haideman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Potsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., $114; Salina, Pa., $119; Niles, O., $125; Los Angeles, Pittsburg, Calif., $137.20.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $120; Warren, Niles, O., Hays, Pa., $125; Morrisville, Pa., $123.50; E. Chicago, Ind., Joliet, Rockdale, Ill., $130; Cutler, Utah, $121.55; Los Angeles, $127.85.

Super Duty: Hays, Sproul, Pa., Warren, Windham, O., Athens, Tex., $137; Morrisville, Pa., Niles, O., $140; Joliet, Ill., $143.

Semisilica Brick (per 1000)

Clearfield, Pa. $130; Philadelphia, $116; Woodbridge, N. J., $114.

Insulating Fire Brick (per 1000)

2300° *F:* Masallion, O., $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala., $212.80.

Ladle Brick (per 1000)

Dry Pressed: Bessemer, Ala., $64.60; Aisey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Mexico, Mo., $77.50; Wellsville, O., $81.50; Clearfield, Pa., Portsmouth, O., $87; Peria, Ark., $109; Los Angeles $110.25; Pittsburg, Calif., $111.30.

High-Alumina Brick (per 1000)

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $181; Danville, Ill., $169.30.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Clearfield, Pa., $225; Danville, Ill., $213.20.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $260; Danville, Ill., $258; Clearfield, Pa., $267.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $147; Clearfield, Pa., $148.50; St. Louis, $159.30; Athens, Tex., $155.

Nozzles (per 1000)

Reesdale, Pa., $234.70; Johnstown, Pa., $240.70; Clearfield, Pa., $241.40; St. Louis, $259.45; Athens, Tex., $247.70; Bridgeburg, Pa., $267.50.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $183.50; Clearfield, Pa., $185.50; St. Louis, $195.80; Athens, Tex., $191.80.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettaville, Millersville, Martin, Narlo, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $15.10; Dolly Siding, Bonne Terre, Mo., $13.65.

Magnesite (per net ton)

Domestic, dead-burned bulk, ¼-in. grains with fines: Luning, Nev., Chewelah, Wash., $38.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$13.50-$14.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearny, N. J., ovens	$24.50
Camden, N. J., ovens	24.00
Everett, Mass., ovens	
New England, deld.	*26.05
Chicago, ovens	24.50
Chicago, deld.	26.00
Terre Haute, Ind., ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Cincinnati, deld.	25.85
Painesville, O., ovens	25.50
Cleveland, deld.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld.	27.58
Buffalo, ovens	25.00
Buffalo, deld.	26.25
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	24.00
Swedeland, Pa., ovens	24.00
St. Louis, ovens	
St. Louis, deld.	26.00
St. Paul, ovens	*24.25*
Portsmouth, O., ovens	24.00
Cincinnati, O., deld.	26.62
Detroit, ovens	25.50
Detroit, deld.	26.50
Pontiac, deld.	27.06
Saginaw, deld.	28.58

*Or within $4.55 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzol	36.00
Toluol, one deg.	32.00-35.00
Industrial xylol	32.00-35.00

Per ton, bulk, ovens

Sulphate of ammonia	$42-$45
Birmingham area	42.00†

†With port equalization against imports.

Cents per pound, producing point

Phenol, 40 deg. (U.S.P.), tank cars	18.00
c.l. drums	19.00
l.c.l. drums	19.50

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $35-$36; 70%, $32-$33; 60%, $28-$29. Imported, net tons, duty paid, metallurgical grade: European, $28-$30; Mexican, $25.50.

Electrodes

Threaded with nipple, unboxed, f.o.b. plant

GRAPHITE

Inches Diam	Length	Per 100 lb
2	24	$47.75
2½	30	30.75
3	40	30.00
4	40	28.50
5⅛	40	28.25
6	60	25.50
7	60	25.25
8, 9, 10	60	22.75
12	72	26.00
14	60	22.50
16	72	21.50
17	60	22.00
18	72	21.50
20	72	21.25

CARBON

8	60	11.40
14, 12, 10	60	11.10
14	72	10.25
17	60	10.25
17	72	9.85
20	84	9.85
20	90	9.65
24	72, 84	9.85
24	96	9.60
30	84	9.75
40, 35	110	9.50
40	100	9.50

was an increase of 3,162,536 tons, compared with movement of 5,871,804 tons to May 16 in the 1954 season. It was, however, 6,244,560 tons under the total moved to May 16 in 1953.

Inland Expands Facilities

A multimillion dollar construction program has been launched by Inland Steel Co., Chicago, at its Indiana Harbor (Ind.) Works. A seventh battery of coke ovens and accompanying by-products facilities will be built. Steelmaking capacity also will be increased.

The battery of 87 by-product coke ovens will have annual capacity of 455,000 tons, increasing the firm's cokemaking capacity 21 per cent (to 2,598,000 tons). Output from these ovens will replace coke now purchased. Coal handling and storing facilities will be expanded, as well as facilities for producing and storing coal chemicals.

The 200,000-ton increase in steelmaking capacity to 5.2 million tons will be achieved by installing additional and heavier equipment for charging material into the furnaces and tapping the molten steel in the plant's No. 2 open-hearth shop. It will be the third achieved in consecutive years without construction of new furnaces. By improvements in process, methods and equipment, 300,000 tons were added in 1954 and 200,000 tons in 1953. The use of oxygen to speed steelmaking and other improvements in techniques have shortened the periods between furnace tappings.

Importers Quote Firm Prices

Prices are nominal on most European steel products usually handled by importers. Exceptions are sheet piling, barbed wire, nails and furring channels. Deliveries on these latter items are not so greatly extended as in the case of most other products.

Steel Import Prices

(Base, per 100 lb, landed, duty paid)

	North Atlantic	South Atlantic	Gulf Coast	West Coast‡
Deformed Bars, Intermediate, ASTM-A-305	$5.50*	$5.50*	$5.50*	$5.78*
Bar Size Angles	5.25*	5.25*	5.25*	5.53*
Structural Angles	5.00*	5.00*	5.00*	5.28*
I-Beams	5.00*	5.00*	5.00*	5.28*
Wide Flange Beams	5.15*	5.15*	5.15*	5.43*
Steel Sheet Piling	5.20	5.20	5.20	5.67
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	29.43	29.43	29.43	30.26
Barbed Wire (†)	6.05	6.05	6.05	6.23
Merchant Bars	5.50*	5.50*	5.50*	5.78*
Hot-Rolled Bands	6.00*	6.00*	6.00*	6.28*
Wire Rods, Thomas Commercial No. 5	5.40*	5.40*	5.40*	5.68*
Wire Rods, O-H Cold Heading Quality No. 5	5.85*	5.85*	5.85*	6.13*
Bright Common Wire Nails	7.15	7.15	7.15	7.45

‡Not including $2.20 per net ton customarily charged in most West Coast ports for wharfage and handling. †Per 82-lb, net, reel. *Nominal.

OD Sizes	Wgt/Foot/Lb	Gulf Port	West Coast	Vancouver
Seamless A.P.I. Casing, Grade J-55:				
5½ in.	15.5	$1.47/ft	$1.51/ft	$1.32/ft
7 in.	23	2.10/ft	2.17/ft	1.90/ft
Seamless N-80 Casing:				
5½ in.	17	1.94/ft	2.00/ft	1.75/ft
7 in.	23	2.50/ft	2.70/ft	2.36/ft
Seamless J-55 tubing:				
2⅜ in.	4.7	0.60/ft	0.63/ft	0.55/ft
2⅞ in.	6.5	0.80/ft	0.83/ft	0.73/ft

Sources of shipment: Western continental European (Schuman Plan) countries.

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Firm prices generally can be quoted.

Sheet piling can be had within two to three months, nails within two months and barbed wire within three weeks. Furring channels are available within a few weeks, with prices clarified recently at about 4 per cent higher than they were.

Prices on seamless casing and tubing at gulf and west coast ports are steady. But too little tonnage is coming in along the eastern seaboard to permit a test at eastern ports.

Scrap . . .

Scrap Prices, Page 168

New York—Reflecting the continued shortage of nickel, stainless steel scrap prices have advanced again. New York brokers are paying $235-$240 for 18-8 sheets, clips and solids; and $105-$110 for 18-8 borings and turnings. Chromium grades have been advanced somewhat in sympathy with the trend in nickel scrap. Brokers are paying $95-$100 for 430 sheets, clips and solids; and $75-$80 for 410 grades.

Carbon steel and cast iron scrap prices are unchanged although there is a slightly stronger trend in the No. 1 grades of melting steel and bundles.

Philadelphia—Scrap prices are unchanged, except for a slight advance in short shovel turnings to $24-$25, delivered; and a reduction in heavy breakable cast to $40-$41.

Boston—Steel scrap prices have sagged, being off $1 to $2 a ton for all shipping points. The range varies according to freight to central Massachusetts, eastern Pennsylvania and dock. Best price for heavy melting steel is $32, dock. Lighter grades of industrial scrap are down in line with bundles and heavy melting. The supply of No. 2 bundles is on the high side, and buying is light, with grade differentials mixed.

Chicago—The enigma of low scrap prices in the face of near-record steelmaking continues. Supply of high-quality factory scrap is so plentiful that not all of it can flow back to mills on a direct shipment basis. The result: Some is disposed of to dealers and loses its identity as of factory origin and quality. As dealer material its value falls from $1 to $3 a ton.

Pittsburgh—Activity is centered on filling previous orders. There is a lull in purchasing, following ordering which lowered prices ten days ago. Mills are reluctant to place orders in face of a possible automotive strike.

Purchasing agents are watching labor developments closely, which accounts for some of the current lull in buying. There is little activity in either blast furnace or cast iron scrap. No. 1 railroad heavy melting scrap sold for $38 a ton in the last sale. That increased the price range $1.

Cleveland—Steel grades of scrap are unchanged with buying at a virtual standstill. Cast iron grades, however, are slightly firmer, several items being quoted $1 higher. Mill stocks are large. With production scrap coming out in heavy volume, the tone of the market is weak. The uncertainty of labor developments in the steel and auto industries makes for bearishness.

Buffalo—Scrap prices are nominal, with mill buying lacking. Dealers report the market is soft and price declines of $1 a ton are believed in the offing.

Cincinnati—Scattered weakness caused further price declines in scrap here. No. 2 heavy melting and No. 2 bundles dropped $1.50 to $27-$28 and $21-$22, respectively.

St. Louis—Scrap market activity has declined as melters tend to hold back orders for anticipated price softening.

Birmingham—Settlement of the Louisville & Nashville railroad strike has permitted delivery of previously loaded cars of scrap. This has slowed buying.

Los Angeles—Reacting to lagging demand, collections of steelmaking scrap have fallen 15 per cent. Auto wreckers complain that prices are too low.

San Francisco—Steel scrap prices are holding their recent gains. Present levels are expected to be maintained in view of continued foreign demand and a firm steel mill operating rate.

Seattle — The scrap market is stabilized, with receipts increasing and local steel production larger than a year ago.

Scrap Men Get Suggestions

Sen. John J. Sparkman (Dem., Ala.), chairman, Senate Small Business Committee, has promised the National Federation of Independent Scrap Yard Dealers a congressional battle against any attempt to make monopolistic mergers by big business easier. He spoke before a recent meeting of the Federation in New York.

Edward W. Greb, technical consultant, recommended to the Federation members that steps be taken to operate a pilot plant aimed at evolving preparation methods and practices which will become standard.

He urged adoption of a product guarantee and a No. 2 bundle trademark. Also, he proposed that No. 2 bundles be prepared at the proposed pilot plant and sold to consumers for testing purposes. He also suggested the Federation draw up quality enforcement regulations.

Structural Shapes . . .

Structural Shape Prices, Page 150

Structural steel deliveries are lengthening, with construction requiring heavy tonnages for active summer road and bridge building programs. Other public building is providing strong demand, and commercial projects are fairly prominent. Industrial construction, however, is relatively slow for this period.

The market is reported livelier at Philadelphia, with public work expanding and fair improvement in other directions noted. The Delaware River Port Authority brought out the largest new inquiry in the area—between 6000 and 7000 tons of bridge approach work. Few outstanding awards are noted in the New York market, but inquiry there is described as active.

(*Please turn to page* 170)

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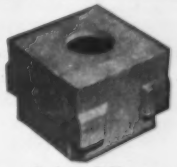


Sales Office
132 S. Whitfield St.
PITTSBURGH 6, PA. EM: 2-0614

Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

May 18	$34.83
May 11	34.83
April Avg.	36.73
May 1954	28.00
May 1950	33.82

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer's plant)

No. 1 heavy melting	34.00-35.00
No. 2 heavy melting	31.00-32.00
No. 1 bundles	34.00-35.00
No. 2 bundles	26.00-27.00
No. 1 busheling	34.00-35.00
Machine shop turnings	*20.50-21.50*
Mixed borings, turnings	*20.50-21.50*
Short shovel turnings	24.00-25.00
Cast iron borings	24.00-25.00
Cut structurals, 5 ft lengths	39.00-40.00
Heavy turnings	*33.00-34.00*
Punchings & plate scrap	39.00-40.00
Electric furnace bundles	38.00-39.00

Cast Iron Grades

No. 1 cupola	39.00-40.00
Charging box cast	34.00-35.00
Heavy breakable cast	34.00-35.00
Unstripped motor blocks	25.00-26.00
No. 1 machinery cast	43.00-44.00

Railroad Scrap

No. 1 R.R. heavy melt.	*37.00-38.00*
Rails, 2 ft and under	47.00-48.00
Rails, 18 in. and under	48.00-49.00
Rails, random lengths	43.00-44.00
Railroad specialties	42.50-43.50

Stainless Steel Scrap

18-8 bundles & solids	210.00-220.00
18-8 turnings	105.00-110.00
430 bundles & solids	95.00-100.00
430 turnings	60.00-65.00

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting	31.00-32.00
No. 2 heavy melting	*25.00-26.00*
No. 1 bundles	31.00-32.00
No. 2 bundles	23.00-24.00
No. 1 busheling	31.00-32.00
Machine shop turnings	14.00-15.00
Mixed borings, turnings	21.00-22.00
Short shovel turnings	21.00-22.00
Cast iron borings	21.00-22.00
Low phos.	33.00-34.00
Cut structural plates 2 ft and under	38.00-39.00
Alloy free, short shovel turnings	26.50-27.50
Electric furnace bundles	31.00-32.00

Cast Iron Grades

No. 1 cupola	*43.00-44.00*
Charging box cast	*37.00-38.00*
Stove plate	*43.00-44.00*
Heavy breakable cast	*33.00-34.00*
Unstripped motor blocks	25.00-26.00
Brake shoes	30.00-31.00
Clean auto cast	*44.00-45.00*
Burnt cast	*32.00-33.00*
Drop broken machinery	44.00-45.00

Railroad Scrap

No. 1 R.R. heavy melt.	34.00-35.00
R.R. malleable	43.00-44.00
Rails, 2-ft and under	*49.00-50.00*
Rails, 18-in. and under	*50.00-51.00*
Rails, random lengths	*44.00-45.00*
Cast steel	39.00-40.00
Railroad specialties	39.00-40.00
Uncut tires	*43.00-44.00*
Angles, splice bars	*45.00-46.00*
Rails, rerolling	52.00-53.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	200.00-210.00
18-8 turnings	100.00-110.00
430 clips, bundles, solids	90.00-100.00
430 turnings	40.00-50.00

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting	34.00-35.00
No. 2 heavy melting	*30.00-31.00*
No. 1 bundles	34.00-35.00
No. 2 bundles	24.00-25.00
No. 1 busheling	34.00-35.00
Machine shop turnings	16.00-17.00
Short shovel turnings	23.00-24.00
Cast iron borings	23.00-24.00
Low phos.	35.00-36.00
Electric furnace bundles	34.00-35.00

Railroad Scrap

No. 1 R.R. heavy melt.	35.00-36.00

CHICAGO

No. 1 heavy melting	33.00-35.00
No. 2 heavy melting	29.00-30.00
No. 1 factory bundles	35.00-36.00
No. 1 dealer bundles	*32.00-33.00*
No. 2 bundles	*23.00-24.00*
No. 1 busheling	33.00-35.00
Machine shop turnings	16.00-17.00
Mixed borings, turnings	18.00-19.00
Short shovel turnings	18.00-19.00
Cast iron borings	18.00-19.00
Cut structurals, 3 ft	36.00-37.00
Punchings & plate scrap	37.00-38.00
Electric furnace bundles	35.00-36.00

Cast Iron Grades

No. 1 cupola	40.00-41.00
Stove plate	*33.00-34.00*
Unstripped motor blocks	29.00-30.00
Clean auto cast	*44.00-45.00*
Drop broken machinery	*44.00-45.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*36.00-37.00*
R.R. malleable	*45.00-46.00*
Rails, 2-ft and under	*49.00-50.00*
Rails, 18-in. and under	*50.00-51.00*
Angles, splice bars	*43.00-44.00*
Rails, rerolling	*51.00-52.00*

Stainless Steel Scrap

18-8 bundles & solids	220.00-225.00
18-8 turnings	95.00-100.00
430 bundles & solids	105.00-110.00
430 turnings	45.00-50.00

Chicago Mercantile Exchange
(Week ended May 18)

No. 1 Heavy Melting

	High	Low	Close
Oct.	....	....	35.50*
Jan.	....	....	....

Sales (160-ton units): None.
*Nominal

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	27.50
No. 2 heavy melting	21.00
No. 1 bundles	27.50
No. 2 bundles	19.00
No. 1 busheling	27.50
Machine shop turnings	13.00
Mixed borings, turnings	13.00
Short shovel turnings	16.50
Punchings & plate scrap	33.00

Cast Iron Grades

Charging box cast	28.00
No. 1 cupola	37.00
Stove plate	32.00
Heavy breakable	28.00
Unstripped motor blocks	20.00
Clean auto cast	42.00
Malleable	35.00

BIRMINGHAM

No. 1 heavy melting	32.00-33.00
No. 2 heavy melting	28.00-29.00
No. 1 bundles	31.00-32.00
No. 2 bundles	23.00-24.00
No. 1 busheling	32.00-33.00
Cast iron borings	17.00-18.00
Short shovel turnings	25.00-26.00
Machine shop turnings	19.00-20.00
Electric furnace bundles	32.00-33.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	45.00-46.00
Stove plate	42.00-43.00
Bar crops and plate	36.00-37.00
Structural plate, 2 ft	36.00-37.00
Unstripped motor blocks	35.50-36.50

Railroad Scrap

No. 1 R.R. heavy melt.	36.00-37.00
Rails, 18 in. and under	45.00-46.00
Rails, rerolling	43.00-44.00
Rails, random lengths	42.00-43.00
Angles, splice bars	43.00-44.00
Stand. steel axles	35.00-36.00

PHILADELPHIA

(Delivered consumer's plant)

No. 1 heavy melting	35.50-36.50
No. 2 heavy melting	32.50
No. 1 bundles	35.50-36.50
No. 2 bundles	26.50
No. 1 busheling	35.50-36.50
Electric furnace bundles	39.50
Machine shop turnings	21.50
Mixed borings, turnings	21.50
Short shovel turnings	*24.00-25.00*
Structurals & plate	40.00-41.00
Heavy turnings	34.00-35.00
Couplers, springs, wheels	42.00
Rail crops, 2 ft & under	51.00-52.00

Cast Iron Grades

No. 1 cupola	37.00-38.00
Malleable	44.00
Heavy breakable cast	*40.00-41.00*
Drop broken machinery	44.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	31.00-32.00
No. 2 heavy melting	27.00-27.50
No. 1 bundles	31.00-32.00
No. 2 bundles	22.00-23.00
Machine shop turnings	12.00-13.00
Mixed borings, short turnings	14.00-15.00
Short shovel turnings	15.00-16.00
Low phos. (structural & plate)	34.00-35.00

Cast Iron Grades

No. 1 cupola	32.00-33.00
Unstripped motor blocks	22.00-23.00
Heavy breakable	33.00-34.00

Stainless Steel

18-8 sheets, clips, solids	*235.00-240.00*
18-8 borings, turnings	*105.00-110.00*
430 sheets, clips, solids	*95.00-100.00*
410 sheets, clips, solids	*75.00-80.00*

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*27.00-28.50*
No. 2 heavy melting	*21.00-22.00*
No. 1 bundles	*27.00-28.00*
No. 2 bundles	16.00-17.00
Machine shop turnings	*11.00-12.00*
Mixed borings, turnings	*14.00-15.00*
Short shovel turnings	*15.00-16.00*
No. 1 cast	30.00-31.00
Mixed cupola cast	28.00-29.00
No. 1 machinery cast	33.00-34.00

BUFFALO

No. 1 heavy melting	30.00-31.00
No. 2 heavy melting	26.00-27.00
No. 1 bundles	30.00-31.00
No. 2 bundles	24.00-25.00
No. 1 busheling	30.00-31.00
Mixed borings, turnings	20.50-21.50
Machine shop turnings	19.00-20.00
Short shovel turnings	21.50-22.50
Cast iron borings	20.50-21.50
Low phos.	33.00-34.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	37.00-38.00
No. 1 machinery	42.00-43.00

Railroad Scrap

Rails, random lengths	35.00-36.00
Rails, 3 ft and under	42.00-43.00
Railroad specialties	36.50-37.50

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	31.50-32.50
No. 2 heavy melting	*27.00-28.00*
No. 1 bundles	31.50-32.50
No. 2 bundles	*21.00-22.00*
No. 1 busheling	31.50-32.50
Machine shop turnings	19.00-20.00
Mixed borings, turnings	17.50-18.50
Short shovel turnings	22.00-23.00
Cast iron borings	17.50-18.50
Low phos., 18-in.	*37.00-38.00*

Cast Iron Grades

No. 1 cupola	*39.00-40.00*
Heavy breakable cast	35.00
Charging box cast	36.00
Drop broken machinery	*44.00-45.00*

Railroad Scrap

No. 1 R.R. heavy melt.	32.50-33.50
Rails, 18-in. and under	*47.00-48.00*
Rails, random lengths	40.00-41.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	31.00
No. 2 heavy melting	29.00
No. 1 bundles	31.00
No. 2 bundles	24.50
Machine shop turnings	16.00
Short shovel turnings	18.00

Cast Iron Grades

No. 1 cupola	40.00
Charging box cast	33.00
Heavy breakable cast	33.00
Unstripped motor blocks	33.00
Brake shoes	32.00
Clean auto cast	42.00
Stove plate	34.00

Railroad Scrap

No. 1 R.R. heavy melt.	37.00
Rails, 18-in. and under	46.00
Rails, random lengths	40.00-41.00
Rails, rerolling	50.00
Angles, splice bars	41.00

SEATTLE

(Delivered consumer's plant)

No. 1 heavy melting	33.00
No. 2 heavy melting	29.00
No. 1 bundles	25.00
No. 2 bundles	23.00
No. 3 bundles	16.00-17.00
Machine shop turnings	15.00-16.00
Mixed borings, turnings	15.00-16.00
Short shovel turnings	15.00-16.00
Electric furnace, No. 1	39.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	36.00-40.00
Heavy breakable cast	28.00
Unstripped motor blocks	30.00-32.00
No. 1 wheels	24.00-25.00
Stove plate (f.o.b. plant)	28.00-29.00
Brake shoes	28.00-29.00

Railroad Scrap
(Delivered consumer's plant)

Rails, random lengths	34.00

LOS ANGELES

No. 1 heavy melting	28.00
No. 2 heavy melting	24.00
No. 1 bundles	27.00
No. 2 bundles	22.00
Machine shop turnings	8.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	42.00-44.00

SAN FRANCISCO

No. 1 heavy melting	30.00
No. 2 heavy melting	28.00
No. 1 bundles	29.00
No. 2 bundles	25.00
No. 1 busheling	30.00
Machine shop turnings	10.00-11.00
Mixed borings, turnings	10.00-11.00
Short shovel turnings	12.00
Cast iron borings	12.00
Cut structurals	30.00
Heavy turnings	11.00
Punchings & plate scrap	30.00

Cast Iron Grades

No. 1 cupola	40.00-43.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast	36.00
Unstripped motor blocks	30.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	48.00

HAMILTON, ONT.

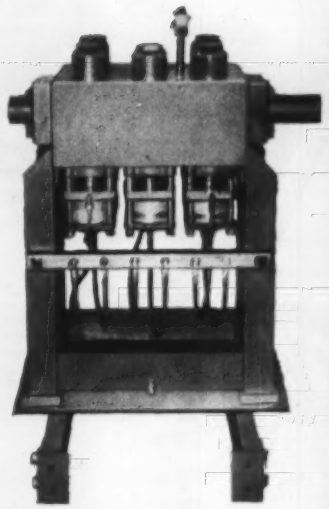
(Delivered prices)

No. 1 heavy melting	34.00
No. 2 heavy melting	31.00
No. 1 bundles	34.00
No. 2 bundles	28.00
Mixed steel scrap	28.00
Mixed borings, turnings	16.00
Rails, remelting	43.00
Busheling, new factory: Prepared	32.00
Unprepared	28.00
Short steel turnings	16.00

Cast Iron Grades†

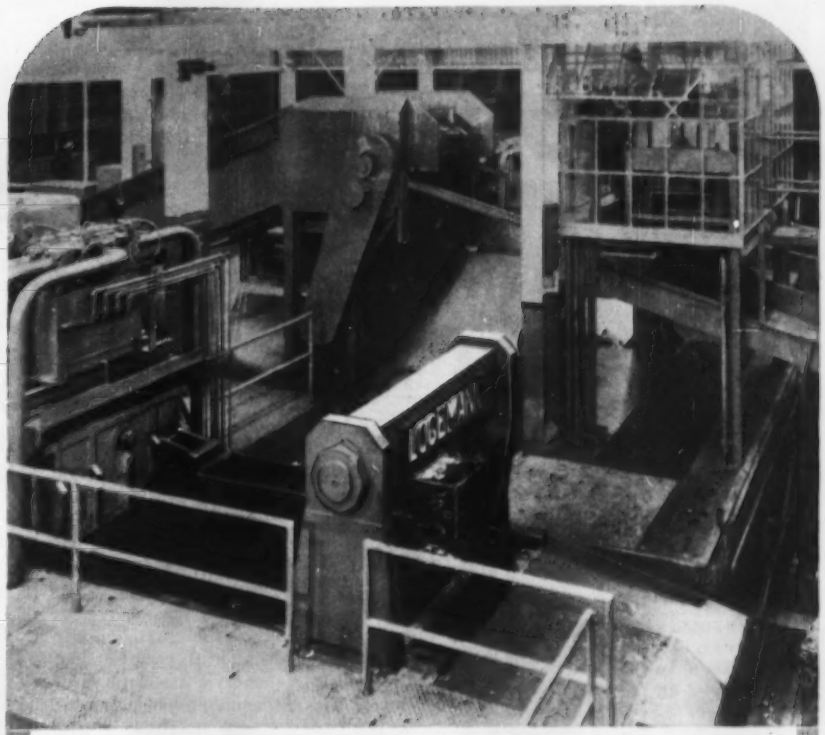
No. 1 machinery cast	42.00-45.00

†F.o.b., shipping point.



LOGEMANN HYDRAULIC OPERATING VALVE

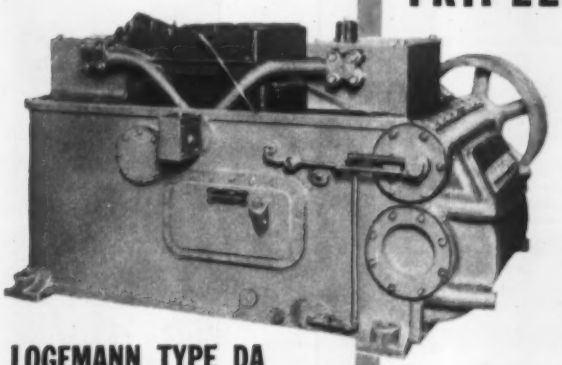
This compact valve was designed to control the movements of the hydraulic rams in large scrap presses but can be modified to suit similar operations on other hydraulic equipment. Interested parties will please outline the nature of the service, operating sequence, gallonage and pressure requirements.



Get low cost, high density bales with LOGEMANN SELF-CONTAINED TRIPLE-COMPRESSION PRESSES

The illustration shows one of two large scrap-press units in a modern automotive plant. Over a period of many years, such units have baled sheet scrap skeletons and trim from metal operations in large industrial plants throughout the country, forming the scrap into high-density bales for re-melting in steel mills. Low baling costs are the result of correct design for heavy duty service, minimum maintenance and operating interruptions, as well as simplicity, accessibility and safety features.

Pioneers in the metal baling field, LOGEMANN engineers embodied in the design those features that have proven dependable over an extended period of years. Some installations in service over 35 years are still operating economically.



LOGEMANN TYPE DA DOUBLE PRESSURE PUMPS

These compact and efficient opposed-cylinder reciprocating-plunger pumps for low and high pressure service lend themselves to a wide range of double pressure applications. They are close-coupled, reliable, and capable of delivering high gallonage, at low and high pressures, at low power costs.

Tell Us the nature of your scrap!

LOGEMANN press sizes are not confined to the large models. Producers of sheet scrap—steel, copper, brass, or aluminum—are invited to submit their scrap baling problems regardless of tonnage. Please state the character of the metal, minimum tonnage to be handled in a given period of hours, range of gauges and, where possible, indicate maximum and minimum lengths and widths of pieces. Experienced sales engineers are available for discussion of your conditions and requirements.

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Weldless, hex-end bodies are drop forged from special bar quality forging steel.

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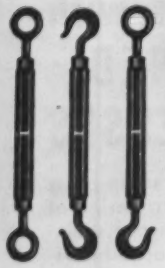
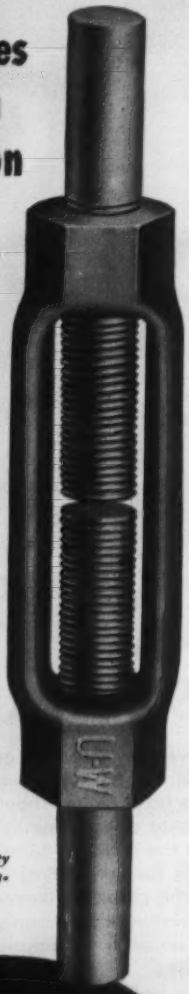
Threading is American National Course series, class 2 fit, for easy assembly.





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New York • Chicago • Pittsburgh

MANUFACTURERS OF TACKLE BLOCKS, WIRE ROPE, ROPE FITTINGS • ESTABLISHED 1871

(*Concluded from page* 167)

While 7500 tons are yet to be placed for Massachusetts turnpike bridges, new inquiry is slackening for fabricated structural steel in New England. Estimating for school and airfield base building is reported holding. Prices for bridge tonnage in the district tend to be firmer, with more fabricators holding backlogs. Prices below estimates of engineers, however, still are possible.

Substantial volume of public construction of various kinds continues prominent in the market at Cleveland and other Midwest points. Fabricators are pressing for steel deliveries in anticipation of an active summer and fall building campaign.

Some popular sizes of structurals are reported not available for third quarter at Pittsburgh. Wide flange sections and angles are hard to obtain for shipment in that period. Plain material is in noticeably tighter supply in New England, deliveries now extending to August. Some volume, however, still can be had for July shipment. Pittsburgh producers are not equalizing the freight on structurals, and the bulk of the New England load, as a result, is on eastern Pennsylvania mills.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

17,300 tons, tunnel frames, central artery, Boston, to Bethlehem Steel Co., Bethlehem, Pa.; bids direct.

1900 tons, structural work, Tidewater Oil Co., Wilmington, Del., to Belmont Iron Works, Eddystone, Pa.

850 tons, two overhead and two underpass bridges on steel stringers and girders, Northeast expressway, Chelsea, Mass., to Pine Brook Iron Works, Scranton, Pa., through Gil Wyner & Co., Newton, Mass., general contractor.

630 tons, state highway bridge, Aroostook river, Ft. Fairfield, Me., to American Bridge Division, U. S. Steel Corp., Pittsburgh, through Verrier Construction Co., Portland, Me., general contractor.

500 tons, three bridges, Massachusetts turnpike, Sturbridge, Mass., to American Bridge Division, U. S. Steel Corp., Pittsburgh, through Henley-Lundgren Co., Shrewsbury, Mass., general contractor.

435 tons, three 3-span beam bridges, F. E. Everett turnpike, Concord, N. H., to Bancroft & Martin Rolling Mills Co., South Portland, Me., through Manchester Sand, Gravel & Cement Co., Manchester, N. H., general contractor.

STRUCTURAL STEEL PENDING

6500 tons, contract G-4, New Jersey approach work, Philadelphia-Gloucester bridge; plans being issued by Delaware River Port Authority.

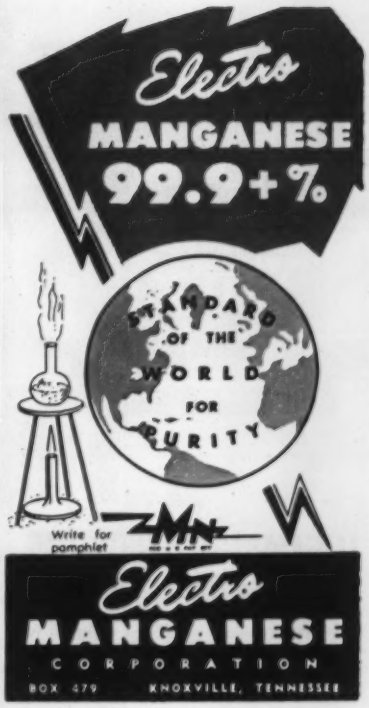
2250 tons, contract P-6, approach work, Philadelphia-Gloucester bridge, Kaufman Construction Co., Philadelphia, low on general contract.

2215 tons, 13 bridges, Massachusetts turnpike, Hopkinton - Westboro - Southboro - Ashland-Framingham, Mass.; M. DeMatteo Construction Co., Quincy, Mass., low on general contract.

2000 tons, hangars, Elmendorf and Ladd air bases, Alaska; bids to U. S. Engineer, May 18.

1800 tons, viaduct structure, Somerville, Mass.; bids May 26, Massachusetts Metropolitan District Commission, Boston.

1000 tons, five bridges, including two 4-span



stringers, Massachusetts turnpike, Chicopee, Mass.; bids in.

835 tons, four bridges, Massachusetts turnpike, Lee-Becket, Mass.; bids June 1, Boston.

450 tons, TWA hangar, International Airport, Philadelphia; Baton Construction Co., Philadelphia, low on general contract.

450 tons, including joists, school, Wilmington, Del., Rupert Construction Co. and Di Sibantino & Son, that city, low, respectively, on each of two alternates.

415 tons, four bridges, including two 4-span stringers, Massachusetts turnpike, Otis-Blandford, Mass.; bids May 25, Boston.

410 tons, including joists, school, Topton, Pa.; H. A. Williams, Allentown, Pa., low on general contract.

250 tons, Baltimore & Ohio Railroad baggage room, Pittsburgh; pending.

185 tons, bridge, Allagash river, Allagash, Me.; bids May 25, Augusta, Me.

165 tons, marine training facilities, Pittsburgh; bids closed by Navy Office, Philadelphia.

100 tons, jail equipment, Grant county, Washington; Decatur Iron & Steel Co., Decatur, Ala., apparently low at $34,500.

100 tons, 100-ft bridge, Washougal river; bids to State Fisheries Commission, Olympia, Wash., June 2.

REINFORCING BARS . . .

REINFORCING BARS PLACED

100 tons, Skagit power plant expansion, to Bethlehem Pacific Coast Steel Corp., Seattle; Buchanan, Sather & DeRycke, Seattle, general contractor at $499,038.

REINFORCING BARS PENDING

1055 tons, 5-stand bridges, Massachusetts turnpike, Chicopee, Mass.; also 22,500 linear feet, steel piles.

755 tons, viaduct structure and bridges, Somerville, Mass.; bids May 26, Metropolitan District Commission, Boston.

130 tons, including 54 tons of shapes, laterals, pump stations, bridge and gates, Columbia Basin project; Cherf Bros. Inc. and Sandkay Contractors Inc., Ephrata, Wash., low at $486,671 to the Bureau of Reclamation, Ephrata, Wash.

100 tons plus, five-story addition to Mt. St. Joseph Hospital, Vancouver, B. C.; general contract to Commonwealth Construction Co. at $594,136.

PLATES . . .

PLATES PENDING

1000 tons, two municipal standpipes, Philadelphia; bids June 6.

600 tons, approximately 10,000 feet of 60 and 14-in. coal tar reservoir pipe line; bids to Tacoma, Wash., May 18.

200 tons, 11,350-bbl. fuel storage for Glasgow, Mont., airbase; bids to U. S. Engineer, Walla Walla, Wash., June 14.

PIPE . . .

CAST IRON PIPE PENDING

200 tons, sewage system project, Yakima, Wash.; bids rejected in excess of estimate; no announcement of future bid plans.

RAILS, CARS . . .

LOCOMOTIVES PENDING

Chesapeake & Ohio, forty 1750-hp diesel units; purchase authorized.

RAILROAD CARS PLACED

Bessemer & Lake Erie, 20 seventy-ton covered hopper cars, to the Pullman-Standard Car Mfg. Co., Chicago.

Boston & Maine, rebuilding 500 boxcars, to own shops, Concord, N. H.

Chicago Great Western, 50 seventy-ton insulated boxcars, to the Thrall Car Mfg. Co.

Long Island, 90 air-conditioned passenger cars, to Worcester, Mass. shops of the Pullman-Standard Car Mfg. Co., Chicago.

Pecos Valley Southern, one caboose to International Railway Car Co., Kenton, O.

Southern Pacific, 110 automatic dump cars, 100 going to Baldwin-Lima-Hamilton Corp., Eddystone, Pa., and 10 to Magor Car Corp., New York.

Western Pacific, 35 steel cabooses, to International Railway Car Co., Kenton, O.

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NEW 3" CARBON STEEL PLATES
Excellent Sizes
Very Attractive Price.
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Position with a future opportunity in our Advertising Department for a young man with proved mechanical aptitude and copywriting ability. Will work creatively with all media on a wide variety of highly technical products. Engineering degree or at least two years metal-working shop experience desirable. Starting salary $4800. We are large well-known manufacturer located in Southern New England. National advertiser. Please write fully and in confidence to Box 259, STEEL, Penton Building, Cleveland 13, Ohio.

WANTED
WORKS MANAGER

Excellent opportunity for man who has successfully managed from 100 to 300 in production work. Salary and bonus based on company net profits, should bring income of $10,000 to $15,000 a year, plus Profit Sharing and Health Insurance. We have no union and no labor trouble. Key men in present organization will benefit from success of new Works Manager so complete cooperation is assured. We are established manufacturers of sheet metal agricultural products, distributed nationally. Previous experience in sheet metal fabrication not an essential requirement. Write stating your age, experience, whom you have worked for, length of time with each employer and reason for leaving, number of employees under your control, and any other information. SIOUX STEEL COMPANY, SIOUX FALLS, SOUTH DAKOTA.

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ACTIVE MANUFACTURERS' AGENCY located in Cleveland with 20 years' experience selling steel mills, foundries and original equipment accounts desires to add additional lines due to expanding business conditions and personnel. Reply Box 261, STEEL, Penton Building, Cleveland 13, Ohio.

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ENGINEER

Registered Active Man, 58, experienced Ferrous Metallurgical and High Temperature Field wants any suitable employment Pittsburgh or Philadelphia areas. Sales ability. Reply Box 260, STEEL, Penton Building, Cleveland 13, Ohio.

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are of equal interest to distributors and manufacturers—use an ad on this page next week to let manufacturers know you are interested in taking on new lines.

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Also STEEL MAKING INDUCTION FURNACE with nominal capacity of 100-300 lbs.
Specify condition, age, and price.
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CORPORATION
WASHINGTON, PENNSYLVANIA

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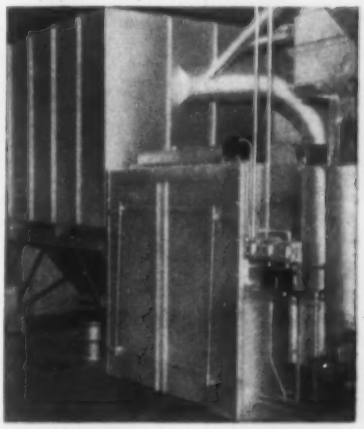
"Tailor-Made"
TO YOUR REQUIREMENTS
MACLEOD
BLAST CLEANING ROOMS

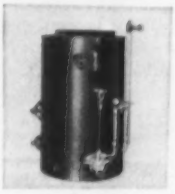


Modern Macleod Blast Cleaning Rooms—designed with the skill and know-how of more than half a century's manufacturing experience—are "tailor-made" to suit the desires of their users. That's why, whatever your specifications or requirements, you can be sure that a Macleod Blast Cleaning Room will fill your needs to your complete satisfaction.

For use with these rooms, Macleod offers a wide selection of Dust Arrestors—in both the screen and filter-tube types. They may be used either as an adjacent (as illustrated above) or outside building installation.

BLAST CLEANING CABINETS

Shown at right is the versatile, new type AL "Rapid-Blast", specifically designed for high rates of continuous production, and especially adaptable to internal cleaning of work. Macleod offers several standard Blast Cleaning Cabinets, such as the "Rapid-Blast", but our Engineering Department will be happy to work with you in designing a special cabinet should your particular requirements demand it.



BLAST CLEANING MACHINES

The Macleod Type "H" Blast Cleaning Machine (at left), is available in both portable and stationary models. Along with low cost operation, it features low initial cost and superior blasting efficiency. Macleod offers an extensive line of Blast Cleaning Machines—portable and stationary, for floor level or pit installation, and in semi-automatic and fully-automatic, continuous cycle models.

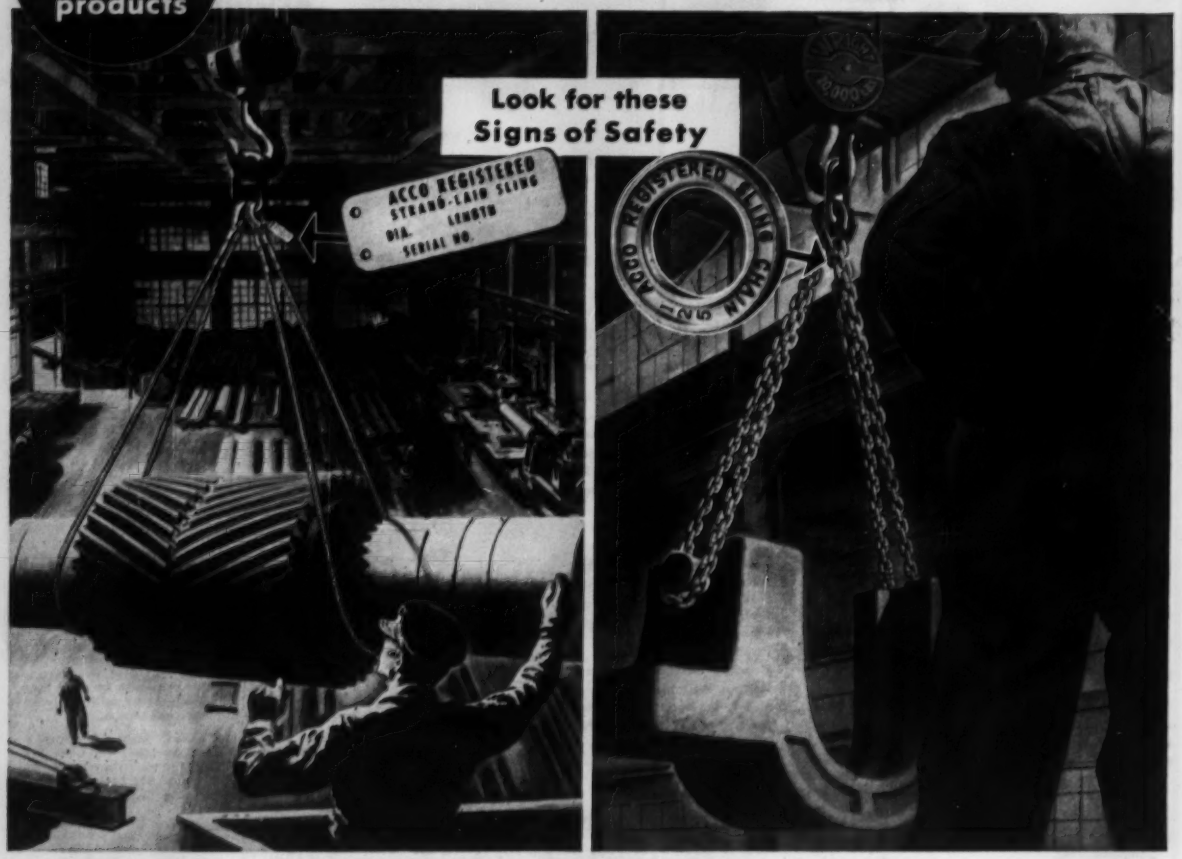
58 YEARS of SERVICE TO INDUSTRY

The MACLEOD COMPANY
33 Mosteller Road, Sharonville, Ohio
Send this coupon for MACLEOD Bulletins:
☐ No. 600 Rooms ☐ No. 300-A Cabinets
☐ No. 200 Machines
Name _____
Address _____
City _____ Zone _____ State _____

ACCO products

ACCO Registered* Slings–Wire Rope & Chain

THE STANDARD OF EFFICIENCY AND SAFETY



SAFETY WITH A SAVING

• Materials Handling is one of the most costly production operations, yet insurance of uninterrupted flow of materials is necessary for efficient and economical production. Regardless of how well production is planned, a dropped load can be very costly even without involvement of personal injury. Time is consumed, machining operations already completed can be rendered valueless, and, if a major machine tool is involved, the whole line is shut down.

ACCO *Registered** Slings are materials handling tools specifically designed to require less hook-up time and through their proved safety actually protect *against* production interruptions. All this is money saved and safety gained.

ACCO *Registered* Safety is More Than Skin Deep

Before any item can be used in an ACCO *Registered** Sling it must prove to be the safest, most-efficient available for its particular use. Then it must prove under actual test to have strength equal to, or higher than, that developed by sling body.

For example, the special ACCO Hooks used in these slings are forged, heat-treated to insure standardized strength, proof-tested, inspected, and magnafluxed. NOTHING IS LEFT TO CHANCE.

Components which have passed these tests are then assembled into completed ACCO *Registered** Slings according to designs which have proved their safety and efficiency in rigorous field tests. Next the completed sling is individually proof-tested to twice the working load limit. Then and only then can it be tagged "ACCO *Registered.*"

Compare the assurance given by this careful control of quality, strength, and design with the methods used in fabricating old fashioned, "home-made" slings.

*Trade Mark Registered

ACCO MAKES BOTH CHAIN AND WIRE ROPE SLINGS . . .

ACCO can supply both types of slings. As you know, there are places where one is preferable to the other. And there are places where a combination of both is called for. Whatever the set-up, ACCO Registered slings will fill the bill with greater safety. ACCO can advise you impartially, can furnish dependable printed information.*

Write or phone your ACCO Distributor. If you don't know him, get his name from the ACCO office in city nearest you.

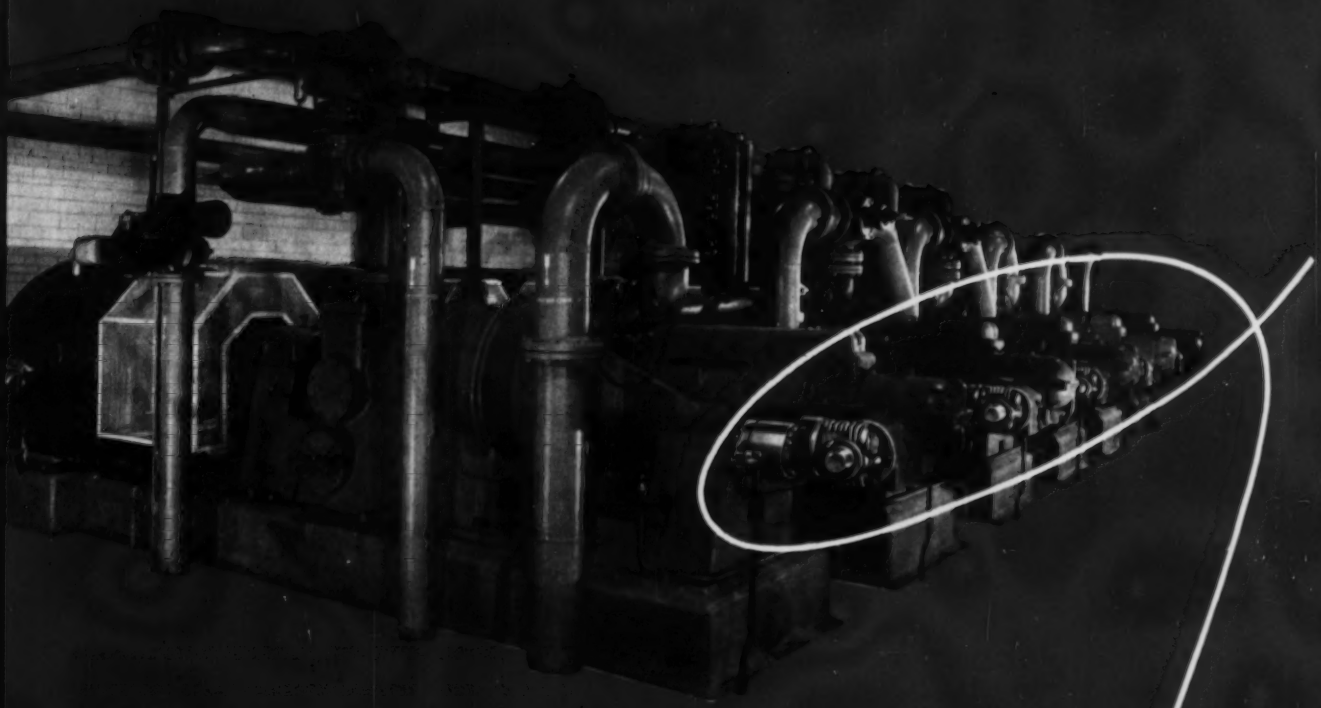
ACCO

TRADE MARK

AMERICAN CHAIN & CABLE
BRIDGEPORT, CONN.

Atlanta, Boston, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Odessa, Tex., Philadelphia, Pittsburgh, Portland, Ore., San Francisco, Wilkes-Barre, Pa., York, Pa.
In Canada: Dominion Chain Co., Ltd., Niagara Falls, Ont.

for Better Value



When you must have slow speed power, always consider first MASTER Right Angle Shaft Gearmotors. They're very compact . . . low in cost . . . safe . . . and so easy to use.

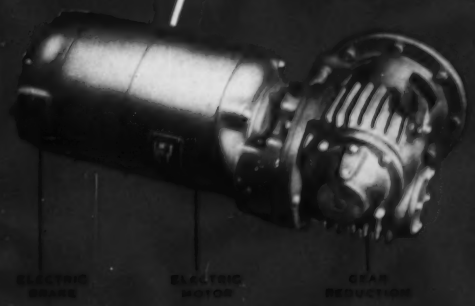
And nowhere else can you get anywhere near the wide range of selection that you have in MASTER Right Angle Gearmotors. They're available in sizes ⅛ to 25 Horsepower for all electrical specifications and in splash-proof, enclosed or explosion-proof construction. Gear reduction ranges up to 430 to 1 with the countershaft in either horizontal or vertical positions. In addition these gearmotors can be supplied with integrally built electric brakes . . . three types of variable speed units . . . and with fluid drive units for cushioned power.

Try them . . . you'll find they're the horsesense way to get slow-speed horsepower.

THE MASTER ELECTRIC COMPANY

DAYTON 1, OHIO

you can't beat them for compact slo-speed power



Straightens tubes of standard wall thicknesses, in all grades, from 4½" to 16½"

...40 TIMKEN® bearings carry the load!

WHEN the Sutton Engineering Company built their new No. 5 M KTC tube straightener, they knew it had to give many years of rugged service despite heavy loads and constant use. So they mounted the two driven rolls, five idler rolls, speed reducer and table rolls on Timken® tapered roller bearings.

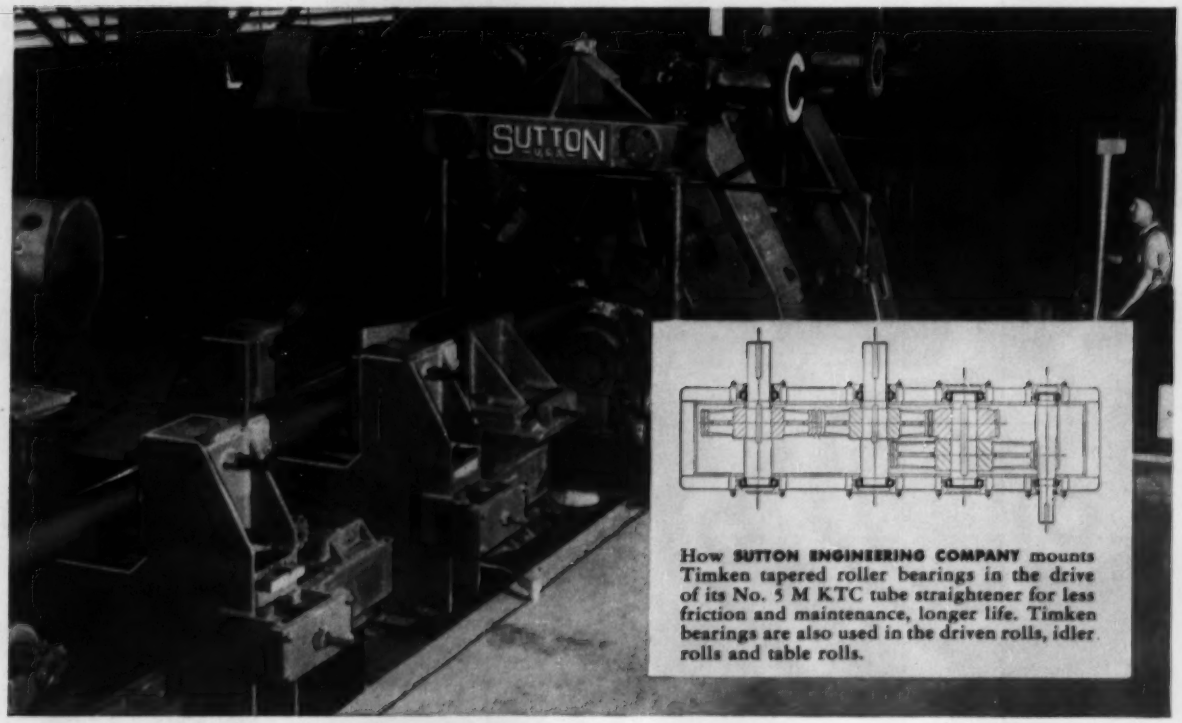
Timken bearings on the rolls easily handle the heavy radial and thrust loads as tubes up to 16½" pass through. That's because Timken bearings are tapered—take radial and thrust loads in any combination. No thrust bearings are required. And full line contact between rollers and races gives them extra load-carrying capacity. Timken bearings keep shafts in accurate alignment, assure smooth operation.

The compactness of Timken bearings permits a high load-carrying capacity in a relatively small-size bearing. Valuable space is saved.

Wear is held to a minimum because Timken bearings practically eliminate friction. They're designed by geometrical law to have true rolling motion. They're made with microscopic accuracy to conform to their design. And they're made of nickel-rich steel we make ourselves. We're the only bearing maker in the country who takes this extra step to insure quality.

To get all these advantages, always specify Timken bearings in the equipment you build or buy. Look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



How **SUTTON ENGINEERING COMPANY** mounts Timken tapered roller bearings in the drive of its No. 5 M KTC tube straightener for less friction and maintenance, longer life. Timken bearings are also used in the driven rolls, idler rolls and table rolls.

IT'S TIMKEN BEARINGS FOR VALUE!

To get the best value in bearings you may find this simple formula helpful:

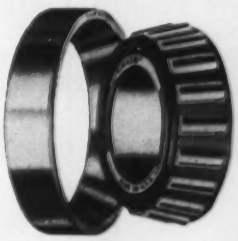
$$Value = \frac{quality + service + public\ acceptance}{price}$$

Obviously a big advantage *above* the line gives you more value than a small one *below*. No other bearing can match the uniform high quality, engineering and field service and overwhelming public acceptance you get with Timken bearings.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



NOT JUST A BALL ◯ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ◯ AND THRUST ◯ LOADS OR ANY COMBINATION ✳